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ABSTRACT

This report is designed to inform the Kentucky Governor, the General Assembly, and the public about the quality of child care in the state. Chapter 1 presents data suggesting that at least one third of Kentucky preschoolers are currently in child care, more children are likely to enter childcare as female labor force participation increases and welfare reform unfolds, and the quality of care has a fundamental impact on children, parents, and the wider public. Chapter 2 presents data on the availability and affordability of quality child care in Kentucky. While data suggest that many parents are satisfied with the availability and affordability of high-quality care in their communities, expert assessments of caregiver-child ratios, group size regulations, training requirements, and compensation reveal that much of Kentucky child care is of questionable quality. Further, more educated parents are much less likely to be satisfied with the availability and affordability of high-quality care. Chapter 3 deals with ways to improve Kentucky child care. A statistical model was used to estimate the relative contribution of various factors to Kentucky child care, and then hypothetical scenarios were generated to estimate the effects of changing ratios, training levels, group size, and pay rates on program quality. Findings point toward caregiver-child ratios, training requirements, and wage rates as targets for enhancing program quality. An expenditure increase of about $10 per child per week was estimated to make marked quality improvements, but over $20 per child per week was necessary to create the highest quality program. Three appendices contain statistical information. (KB)

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Child Care in Kentucky

Current Status and Future Improvements

ED 444 710

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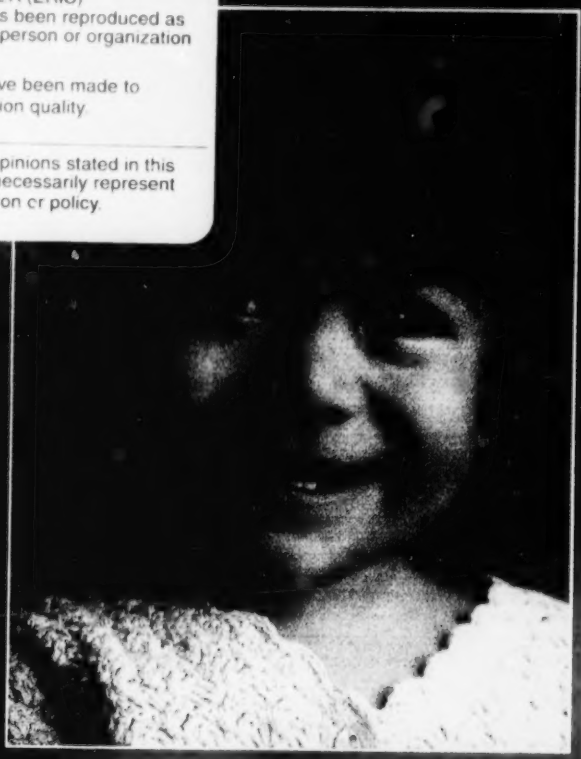

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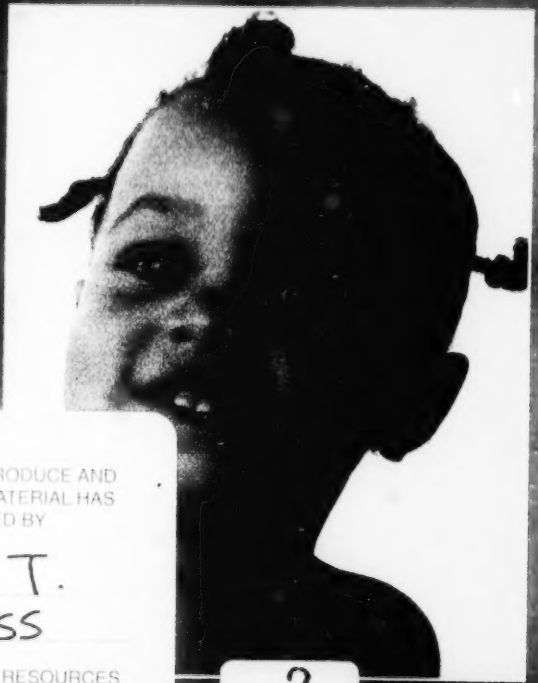

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THE KENTUCKY LONG-TERM POLICY RESEARCH CENTER

Child Care in Kentucky

Current Status and Future Improvements

by
Michael T. Childress

THE KENTUCKY LONG-TERM POLICY RESEARCH CENTER

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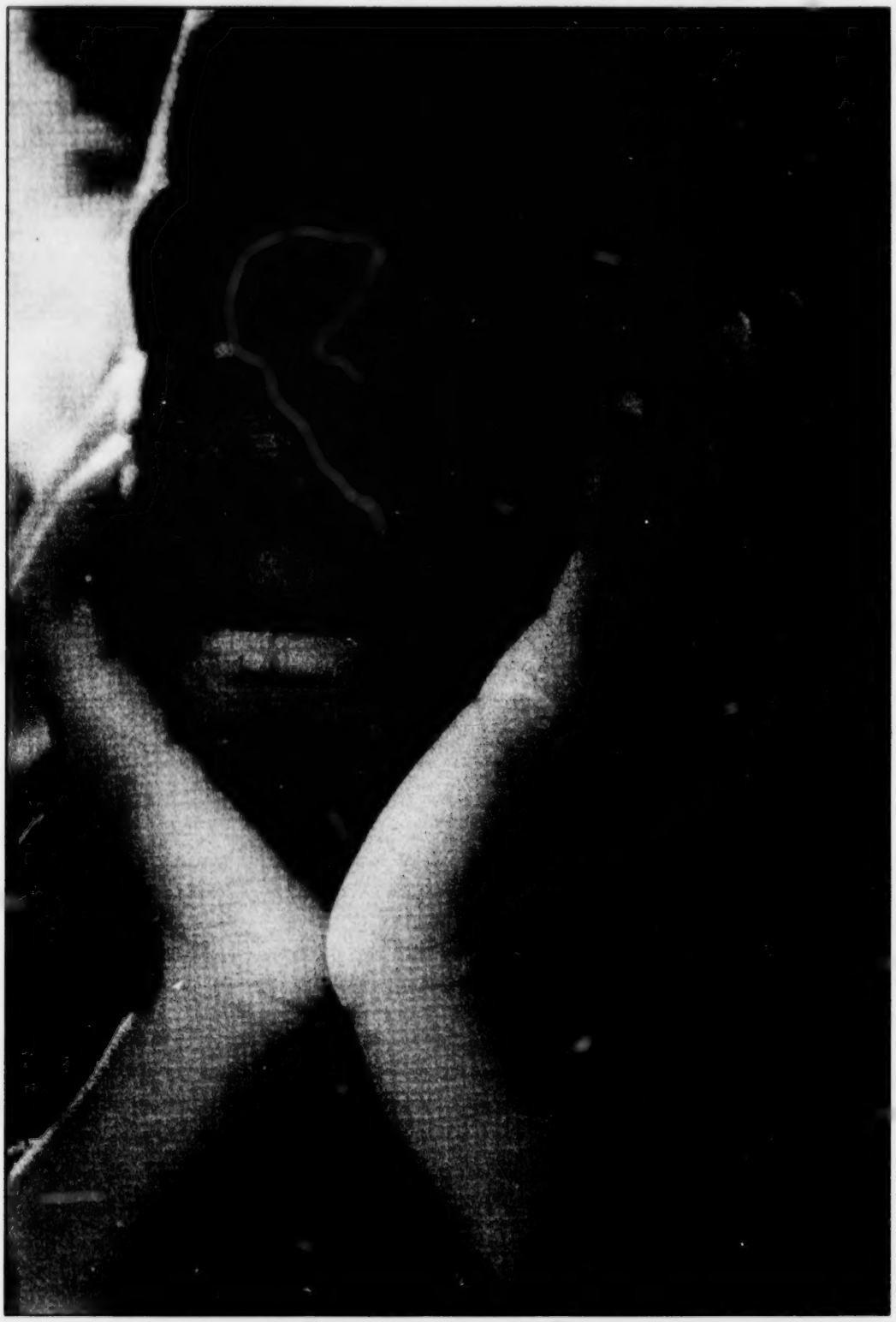

Preface

As part of its mission to advise and inform the Governor, the General Assembly, and the public, the Kentucky Long-Term Policy Research Center presents this report on child care. This report attempts to answer four basic questions about child care in Kentucky:

- Why is quality child care important?
- What do we know about the quality of child care?
- How can we improve the quality of child care?
- What will it cost to enhance the quality of child care?

This report should interest policymakers and citizens who are concerned about the quality of child care in Kentucky and interested in creating a system of higher quality care.

THE KENTUCKY LONG-TERM POLICY RESEARCH CENTER

The Center was created by the General Assembly in 1992 to bring a broader context to the decisionmaking process. The Center's mission is to illuminate the long-range implications of current policies, emerging issues, and trends influencing the Commonwealth's future. The Center has a responsibility to identify and study issues of long-term significance to the Commonwealth and to serve as a mechanism for coordinating resources and groups to focus on long-range planning.

Michael T. Childress is the executive director of the Center. Those interested in further information about the Kentucky Long-Term Policy Research Center should contact his office directly:

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Summary

IT WILL SURPRISE ALMOST NO ONE TO LEARN THAT THE RESEARCH ON CHILD development tells us that the quality of child care has a lifelong effect on children, and, by extension, their parents and society. Depending on the nature of the care, that effect can be positive or negative. Unfortunately, research done by the Kentucky Long-Term Policy Center shows that child care in Kentucky, like most of the other states, is not high quality.

How Well Does Child Care in Kentucky Measure Up?

While child care has manifold components, experts agree that four are key: (a) child-to-staff ratios; (b) group size; (c) staff qualifications; and (d) staff stability.

Measured along these four dimensions, Kentucky comes up short when compared with the best states. This does not mean that Kentucky ranks poorly in comparison with all states. Indeed, it is typical, which simply means that child care across the country is not in good shape. However, when compared with the best states, it lags far behind. It is also worth noting that even the best states do not fully meet the standards experts recommend.

This is not to say that Kentucky parents are dissatisfied with the child care available to them. Indeed, our surveys show that most are satisfied with the availability of quality child care. However, when it comes to the affordability of care, opinion divides about evenly. Three important points merit mention. First, even though most surveyed are satisfied, a substantial percentage (34 to 40 percent) is not. Second, the trends show that people are becoming more dissatisfied. Between 1996 and 1998, more people expressed dissatisfaction with both the availability and affordability of high-quality child care. Third, the education level of the respondents significantly shapes the responses. The more educated people are, the less satisfied they are with the availability and affordability of child care.

Pressures on Child Care Will Increase

Thus, the current child care situation is not good. Furthermore, it is likely to get worse. Many Kentucky preschoolers already are in child care. We estimate that at any one time over 100,000 children under six years old—or about one third of the entire population under six—receive care by someone other than a parent or a relative. Many of these begin child care when only a few weeks old and remain there until they start school.

The rising participation of women in the labor force is likely to increase the number of children needing child care. One of the most dramatic increases in the labor force over the past few years has been among women with children. Na-

tionally, the percentage of women with children who work has risen from about 39 percent in 1975 to over 62 percent in 1996. Furthermore, the Bureau of Labor Statistics projects a continuing increase out to 2006.

What Can Be Done?

Given that child care is important, is not in good shape in Kentucky, and is likely to absorb more children in the future, what can be done? We have analyzed Kentucky child care in light of the four key attributes outlined above. We used a statistical model to estimate the relative contribution of the various attributes. The model enables us to generate "what-if" scenarios by altering ratios, training levels, group size and pay rates (a proxy for stability) and estimate their effect on child care. We developed five alternative scenarios and estimated the cost for each.

The results identify the policy levers and suggest how much each needs to move (and the cost of moving it) to achieve various outcomes. If policymakers want dramatic improvement in Kentucky child care, our results show that:

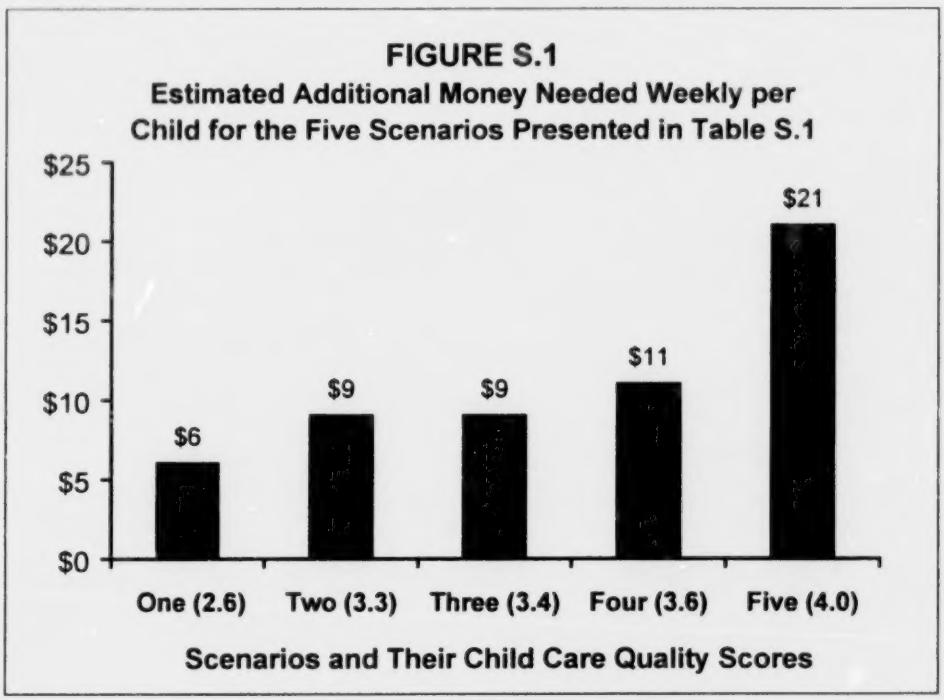
- Child-to-staff ratios need to shrink
- Maximum group sizes need to decrease
- Pre-service requirements for center-based teachers need to increase
- Caregiver wages need to rise

The "child care quality score" of 2.3 shown at the bottom of the second column of Table S.1 is Kentucky's actual score derived from *Working Mother* magazine's 1998 assessment. The subsequent scores are predicted values generated by changing the values of the four key variables. As shown in the "Scenario 5" column, our statistical model predicts that if ratios were lowered, training increased, maximum group sizes lowered and caregiver wages increased, then Kentucky could attain a 4.0 score, which would place it among *Working Mother* magazine's child care elite.

Of course, the issue is always how much would the improvement cost. We estimate the costs of the five scenarios, focusing on caregiver wages and the child-to-staff ratio. We do not estimate training costs, because we assume if wages rise enough to attract better quality staff, they will be better trained. Similarly, we assume that some of the cost of decreasing group size will be accounted for in lowering the child-to-staff ratio. We understand that decreasing group size could have other cost implications such as increased construction costs. We do not estimate those here because of data limitations; we assume, therefore, that our estimates are on the low end.

TABLE S.1 Alternative Scenarios for Enhancing Child Care in Kentucky						
Variables	Kentucky Currently	Scenario One	Scenario Two	Scenario Three	Scenario Four	Scenario Five
Ratio	9	6.6	6.6	6.6	6.6	5.3
Training	(0) None	(0) None	(1) Some	(1) Some	(1) Some	(1) Some
Group Size	(2) Mediocre	(2) Mediocre	(2) Mediocre	(3) Good	(3) Good	(3) Good
Wages	$13,250	$13,250	$14,900	$14,900	$15,900	$17,225
Public Pre-K	(1) Yes	(1) Yes	(1) Yes	(1) Yes	(1) Yes	(1) Yes
Child Care Quality Score	2.3	2.6	3.3	3.4	3.6	4.0
Note: See Appendix C for an explanation on how the scores were generated.						

Figure S.1 shows how much the weekly cost per child could rise under each scenario. It appears that Scenarios 2, 3, and 4 are the most cost effective. They are substantially less expensive than Scenario 5, and the model predicts scores that represent a significant quality increase in Kentucky child care. Raising Kentucky's score from its present 2.3 to 3.3 would move it from the 50th to the 90th percentile, an impressive improvement. However, the aggregate costs are not trivial. The estimated costs for the three scenarios range from an annual cost of $54 million to about $64 million.



A variety of models illustrate how to improve child care systems. Two innovative programs in North Carolina called TEACH (Teacher Education and Compensation Helps) and WAGES (Workers are Gaining Education and Salary) demonstrate how the quality of child care can improve through strategic partnerships of government, child care centers and schools. Government and private funding help defray the cost of sending child care workers to college, many of whom pursue an associate's degree in early child development. Salary supplements are given to those who continue to pursue education and training. Studies show the participants earn more and provide higher quality care.

Conclusions

The recipe for improving child care is well known. A low ratio of children to caregivers, a small group size, well-trained caregivers, and low turnover among staff are all essential ingredients. The ratios, training requirements, and wage rates offer the greatest potential return on investment, and those are the areas that should be targeted. We estimate that a weekly cost increase of about $10 per child will have a substantial effect. However, to move Kentucky's programs to the highest level will probably require an increase of *well over* $20 per child. This increase represents a substantial sum, and several sources will have to be tapped.

Many will need to play a role for this improvement to occur. Federal, state, and local governments obviously have a role. But parents have one as well. They must become better consumers of child care services, knowledgeable about what constitutes good care and insistent on getting it. Businesses can help too, first by recognizing that good child care can directly and positively affect their bottom lines. Success will be achieved only when strategic partnerships between the private and public sectors are forged and the realization takes hold that the short-term costs for improvements to early childhood development programs are often much less than the long-term gains accrued from them.

Acknowledgments

The author would like to thank the Board and staff of the Kentucky Long-Term Policy Research Center for providing encouragement and ideas as this project took shape. Many individuals gave their time and effort to review and comment on an earlier draft of this report: Evelyn Boone, Forrest Calico, Nick Kafoglis, Linda Locke, Deb Miller, Viola Miller, Mark Schirmer, Billie Sebastian, Michal Smith-Mello, Kim Townley, DeeAnn Wenk, and Alayne White. Jerry Sollinger wrote the executive summary and provided much valued editorial support. While many individuals contributed to the content and structure of this report, the Kentucky Long-Term Policy Research Center assumes full responsibility for its content.

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WHY IS QUALITY CHILD CARE IMPORTANT?

I believe the children are our future,
teach them well and let them lead the way.
— Lyrics by Michael Masser & Linda Creed

RESEARCH CONFIRMS WHAT COMMON SENSE SUGGESTS: THE QUALITY OF child care significantly influences young children, their parents, and the wider society. Moreover, a number of economic, social, and demographic factors are likely to increase the number of Kentucky preschoolers[1] in child care from what is already a large number today to an even larger number in the future. For these reasons, the availability and affordability of high quality child care is an issue of paramount importance to the future of the Commonwealth.

A Large Number of Kentucky Preschoolers Are in Child Care

We estimate that at any one time more than 100,000[2] Kentucky preschoolers are cared for every day by someone other than a parent or relative in an organized child care facility or by a family day care provider.[3] This figure represents about one third of all Kentucky children under the age of six. Many

---

[1] We define "preschoolers" as children under six years old not yet in kindergarten.

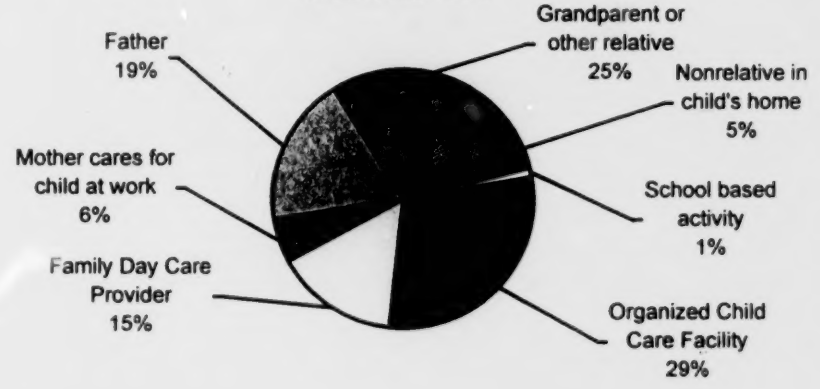
[2] We estimate that at any one time approximately 103,000 of the 320,000 Kentucky children under the age of six use some form of child care or are taken care of by someone other than a relative (see Appendix A). Many mothers move in and out of the labor force and their children move in and out of child care. It is quite likely that far more than 103,000 children are in child care at some time during a year. The Children's Defense Fund estimates the number to be even higher at 187,200, although the assumptions and method for calculating this number are not obvious from the published source. See *Kentucky: Child Care Challenges* (May 1998): (http://www.childrensdefense.org/childcare/challenges/pdf/kentucky.pdf), Internet, 7 May 1999. According to the *1998 Kids Count County Data Book* (Louisville, KY: Kentucky Youth Advocates, 1998), there were 137,371 spaces in licensed centers, licensed homes, and certified homes for preschoolers 4 years and younger in 1998. Another national study conducted in 1990 found that an average of 88 percent of the available spaces in centers were filled. Refer to Kisker, E.E., et al., *A Profile of Child Care Settings: Early Education and Care in 1990* (Washington, DC: U.S. Department of Health and Human Services, 1990). If we multiply 0.88 times the 137,371 spaces we get about 121,000 children using the available spaces.

[3] The following definitions of child care arrangements are provided by the U.S. Census Bureau, Department of Commerce, *Who's Minding Our Preschoolers?* (Fall 1994, Update), Series P70-62: (http://www.census.gov/population/www/socdemo/childcare.html), Internet, 15 April 1998. *Relatives* include mothers, fathers, siblings, grandparents, and other relatives. *Other relatives* include aunts, uncles, and cousins. An *organized child care facility* is a day care center, a nursery school, or a preschool. A *family day care provider* is someone who cares for one or more unrelated children in

of these children will enter care when only weeks old and remain until they start school at age five. A typical child will spend 33 hours per week in care.[4]

According to the U.S. Department of Commerce's Survey of Income and Program Participation (SIPP), about half of preschool children in the United States with *employed* mothers are cared for by nonrelatives (see Figure 1). An estimated 29 percent of these preschoolers are in child care facilities, 15 percent are in family day care,[5] and 5 percent are cared for in their own home by a non-relative.[6]

FIGURE 1
Primary Child Care Arrangements Used for Preschoolers by U.S. Families with Employed Mothers, 1994


Grandparent or other relative 25%
Father 19%
Nonrelative in child's home 5%
Mother cares for child at work 6%
School based activity 1%
Family Day Care Provider 15%
Organized Child Care Facility 29%

Source: U.S. Bureau of the Census

Moreover, it is not unusual for preschoolers whose mothers are not in the labor force to be in child care. According to the Children's Defense Fund, "Many 'stay-at-home' mothers use child care at some point either because they want their child to get a preschool experience or because they go back to work."[7] Nationally approximately 22 percent of preschoolers with mothers who are not in the labor force are cared for in center-based programs[8] and nonrelatives care

her/his home. *In-home babysitters* are nonrelatives who provide care within the child's home. *Non-relatives* include in-home babysitters and family day care providers.

[4] *The NICHD Study of Early Child Care* (Washington, DC: U.S. Department of Health and Human Services, April 1998): 10.

[5] Kentucky has licensed and certified homes. A licensed home is regulated like a licensed center, but is limited to 12 children of varying ages. A certified home is subject to less stringent requirements.

[6] U.S. Census Bureau, Department of Commerce, *Who's Minding Our Preschoolers?*

[7] Children's Defense Fund: (http://www.childrensdefense.org/childcare/cc_momwars.html), Internet, 12 May 1999.

[8] Center-based programs include day care centers, head start programs, preschools, prekindergartens, and other early childhood programs.

for 6 percent (see Table 1).[9] Clearly then, with one third of Kentucky's preschoolers in child care, the availability and affordability of quality child care is an important issue and will continue to be so in the future as more women enter the labor force.

TABLE 1
Percentage of U.S. Children under 6 Years Old Whose Mothers Are Not in the Labor Force by Child Care Arrangement

Child Care Arrangement	Percentage
Relative cares for the child (e.g., grandparent)	7
Nonrelative cares for the child	6
In a center-based program	22
Parent takes care of the child	68

Notes: Estimates are based on children under six years old who have yet to enter kindergarten. Columns do not add up to 100 because some children participated in more than one type of nonparental arrangement. Center-based programs include day care centers, head start programs, preschools, prekindergartens, and other early childhood programs.
Source: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, 1995. Available on-line at http://nces.ed.gov/pubs/95824.html.

Female Labor Force Participation is Likely to Increase

One of the most dramatic increases in labor force participation over the last several years has been among women with children (see Figure 2). Nationally, the labor force participation rate among women with children under six increased from 38.8 percent in 1975 to 62.3 percent in 1996.[10] And the U.S. Bureau of Labor Statistics (BLS) projects that female participation in the labor force will continue to increase until 2006.[11] Indeed, BLS expects that women will comprise 60 percent of new labor force entrants between 1994 and 2005. Over this same time period, BLS expects female labor force participation to increase at double the men's rate.[12] And it should be noted that the female labor force participation rate has been increasing at a much faster rate in Kentucky than in the United States.[13]

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[9] National Center for Education Statistics, "Statistics in Brief: Child Care and Early Education Program Participation of Infants, Toddlers, and Preschoolers," (October 1996): (http://nces.ed.gov/pubs/95824.html), Internet, 5 Feb. 1999.

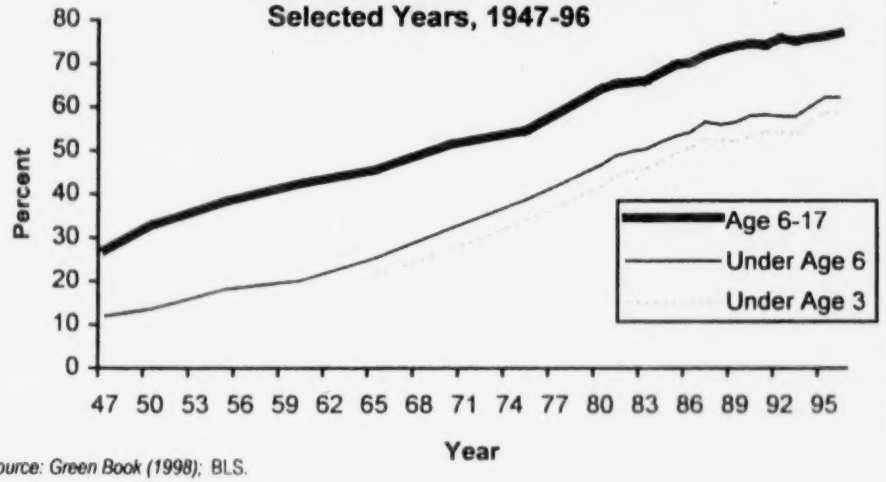
[10] See the *Green Book, 1998*: (http://www.access.gpo.gov/congress/wm001.html), Internet, 28 May 1999. Source: U.S. Department of Labor, Bureau of Labor Statistics.

[11] Cynthia Negrey, "Life in the Balance," *The Future Well-Being of Women in Kentucky*, Eds. Michal Smith-Mello, Michael T. Childress, Jerry Sollinger, and Billie M. Sebastian (Frankfort, KY: Kentucky Long-Term Policy Research Center, 1999) 14.

[12] U.S. Department of the Treasury, *Investing in Child Care: Challenges Facing Working Parents and the Private Sector Response* (1998): (http://www.ustreas.gov/press/releases/docs/chdcare.pdf), Internet, 11 January 1999.

[13] Mark Berger and Amitabh Chandra, "The Gender Wage Gap in Kentucky, 1968-1997," *The Future Well Being of Women in Kentucky*, Eds. Michal Smith-Mello, Michael T. Childress, Jerry Sollinger, and Billie M. Sebastian (Frankfort, KY: Kentucky Long-Term Policy Research Center, 1999) 32.

FIGURE 2
Labor Force Participation Rates of Women, by Presence and Age of Youngest Child, Selected Years, 1947-96



Source: Green Book (1998); BLS.

Welfare Reform Will Increase Demand for Child Care

In August of 1996, President Clinton signed into law the Personal Responsibility and Work Opportunity Reconciliation Act—also known as the Welfare Reform Act. A key element of the Act is a 60-month lifetime limit on welfare assistance that has enormous implications for the availability and affordability of quality child care in Kentucky. Over the next few years, increasing numbers of welfare recipients will be entering the labor force and will require child care.[14] Some have estimated that for every adult on welfare, two children will require child care.[15] Perhaps the greatest difficulty in ensuring that welfare reform succeeds "will be finding and paying for child care for recipients who must work."[16] As welfare reform unfolds in Kentucky, increasing numbers of preschoolers coming from low-income families will be entering child care.[17] The quality of care these children receive will likely make a difference in their lives as well as in their parents' ability to satisfy the key provisions of the Welfare Reform Act.

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[14] Kentucky has a requirement that K-TAP recipients be involved in work activities for 30 hours per week after 24 months of receiving assistance. Moreover, the required work hours increase every year.

[15] Lorraine Garkovich and Julie N. Zimmerman, "Welfare Reform and Kentucky Women," *The Future Well-Being of Women in Kentucky*, Eds. Michal Smith-Mello, Michael T. Childress, Jerry Sollinger, and Billie Sebastian (Frankfort: Kentucky Long-Term Policy Research Center, 1999) 67.

[16] William H. Hoyt and Kathleen Toma, "Welfare Reform in Kentucky: Has 'Welfare as We Know It' Changed?," *1997 Kentucky Annual Economic Report* (Lexington: Center for Business and Economic Research) 27.

[17] According to Terry Wilson, the assistant director for the division of financial management in the Cabinet for Families and Children, the number of families on welfare has decreased by over 26,000 from October 1996 to June 1999. It stood at 66,972 in October 1996 and had dropped to 40,554 by June 1999.

The Quality of Care Affects Young Children

The quality of child care can have a positive or negative influence on a child. Studies show that the quality of care children receive during the early years of life has an enduring impact on their ability to learn and, thus, their future well-being. Children in *low* quality child care have a higher likelihood of being delayed in language and reading skills and of displaying more aggression toward other children and adults.[18] Meanwhile, children who attend higher quality programs evidence more positive outcomes,[19] such as higher levels of cognitive functioning and intellectual development,[20] better language development,[21] and more advanced social development.[22] Moreover, these positive outcomes are found in studies of various designs[23] and even when other important predictor variables are controlled for, such as the mother's education level and family

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[18] Carnegie Corporation, *Starting Points: Meeting the Needs of Our Youngest Children,* 1994, as cited by the Children's Defense Fund: (http://www.childrensdefense.org/), Internet, May 1998.

[19] See the National Association for the Education of Young Children (NAEYC) web site at (http://www.naeyc.org/about/position/pslicense.htm), Internet, 30 April 1999.

[20] Irving Lazar, R. Darlington, H. Murray, J. Royce, and A. Snipper, "Lasting Effects of Early Education: A Report from the Consortium for Longitudinal Studies," *Monographs of the Society for Research in Child Development,* 47: Serial No. 201 (1982); K.A. Clarke-Stewart and C. Gruber, "Daycare Forms and Features," *Quality Variations in Daycare,* ed. R.C. Ainslie (New York: Praeger, 1984): 35-62; H. Goelman and A. Pence, "Effects of Child Care, Family and Individual Characteristics on Children's Language Development: The Victoria Day Care Research Project,"*Quality in Child Care: What Does Research Tell Us?* ed. D.A. Phillips (Washington, DC: NAEYC, 1987); M. Burchinal, M.W. Lee, and C.T. Ramey, "Type of Day Care and Preschool Intellectual Development in Disadvantaged Children," *Child Development* 60 (1989): 128-137; A.Epstein, *Training for Quality: Improving Early Childhood Programs Through Systematic Inservice Training* (Ypsilanti, MI: High/Scope Press, 1993); S. Helburn, ed., *Cost, Quality and Child Outcomes in Child Care Centers,* (Denver: University of Colorado at Denver, 1995); E.S. Peisner and M.R. Burchinal, "Relations Between Preschool Children's Child Care Experiences and Concurrent Development: The Cost, Quality, and Outcomes Study," *Merrill-Palmer Quarterly* 43 (1997): 451-477.

[21] K. McCartney, "The Effect of Quality of Day Care Environment upon Children's Language Development," *Developmental Psychology* 20 (1984): 224-260; M. Whitebook, C. Howes, and D.A. Phillips, *Who cares? Child Care Teachers and the Quality of Care in America. The National Child Care Staffing Study,* (Oakland, CA: Child Care Employee Project, 1989); Peisner, et al., 1997.

[22] K.A. Clarke-Stewart, "Predicting Child Development from Child Care Forms and Features: The Chicago Study," *Quality in Child Care: What Does Research Tell Us?* ed. D.A. Phillips (Washington, DC: NAEYC, 1987); C. Howes, "Relations Between Early Child Care and Schooling," *Developmental Psychology,* 24 (1988): 53-57; M. Whitebook, et al., *Who cares?*; Peisner, et al.

[23] Both cross-sectional and longitudinal studies show these positive outcomes. Refer to J. Carew, *Experience and Development of Intelligence in Young Children at Home and in Day Care,* Monographs of the Society for Research in Child Development, vol. 45 nos. 6-7 (1980); C. Howes, "Relations Between Early Child Care and Schooling," *Developmental Psychology,* 24 (1988): 53-57; D.L. Vandell, V.K. Henderson, and K.S. Wilson, "A Longitudinal Study of Children with Day-Care Experiences of Varying Quality," *Child Development* 59 (1988): 1286-92; C. Howes, "Can the Age of Entry into Child Care and the Quality of Child Care Predict Adjustment in Kindergarten?"*Developmental Psychology,* 26 (2): 292-303; L.J.Schweinhart, H.V. Barnes, and D.P. Weikart with W.S. Barnett and A.S. Epstein, *Significant Benefits: The High/Scope Perry Preschool Study Through Age 27.* High/Scope Educational Research Foundation Monograph, no. 10. (Ypsilanti, MI: High/Scope Press, 1993); W.S. Barnett, "Long-Term Effects of Early Childhood Programs on Cognitive and Social Outcomes," *Center for the Future of Children,* 5(3): 25-50.

income level.[24] And a major study released in 1999 found that the benefits of high-quality child care in the early years can last *at least* until the elementary school years.[25] Researchers found that "the quality of child care experienced by children before they entered school continued to affect their development at least through kindergarten and in many cases through the end of second grade."[26] Other published research has found reduced public costs in addition to clear benefits for the child.[27] A 1998 RAND study found that "for individual states and communities, early (childhood) intervention programs may be a means of reducing the escalating costs of corrections, welfare, and special education."[28] Indeed, they concluded that "early intervention programs can improve childhood development and maternal well-being and may generate future savings that more than offset their costs."[29] Clearly, then, the long-term benefits of high-quality child care are multiple and far reaching.

Conclusion

Quality child care is important for a number of reasons: at least one third of Kentucky preschoolers are in child care currently; more children are likely to enter child care in the future as labor force participation among females increases and welfare reform unfolds; and a significant body of research shows that the quality of care can have a fundamental effect on the child, parents, and the wider public. Given the importance of quality child care, we present data in the next chapter on the availability and affordability of quality child care in Kentucky.

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[24] S. Helburn, ed. *Cost, Quality and Child Outcomes in Child Care Centers,* Technical report, (Denver: University of Colorado at Denver, 1995); NICHD Early Child Care Research Network, "Mother-child interaction and cognitive outcomes associated with early child care: Results of the NICHD study," Paper presented at the 1997 Biennial Conference of the Society for Research in Child Development, Washington, DC.

[25] *The Children of the Cost, Quality, and Outcomes Study Go To School*, Executive Summary, June 1999: (http://www.fpg.unc.edu/~ncedl/PAGES/cqes.htm), Internet, 10 June 1999.

[26] *The Children of the Cost, Quality, and Outcomes Study Go To School.*

[27] Various longitudinal studies have documented that high quality programs for young children living in poverty have lasting benefits and a return on investment.The *High/Scope Perry Preschool Study through Age 27* found a $7.16 return for each dollar invested. Some of the savings were due to reduced special education and welfare costs and higher future worker productivity.See *Quality Care Makes a Difference*: (http://www.igc.apc.org/cwla/publicpolicy/qualitychildcare7-97.html), Internet, 12 May 1999.

[28] Lynn A. Karoly, Peter W. Greenwood, Susan S. Everingham, Jill Houbé, M. Rebecca Kilburn, C. Peter Rydell, Matthew Sanders, and James Chiesa, *Investing in Our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions* (Santa Monica, CA: RAND, 1998): 108.

[29] Karoly, et al.: 105.

WHAT DO WE KNOW ABOUT THE QUALITY OF CHILD CARE IN KENTUCKY?

We worry about what a child will be tomorrow,
yet we forget that he is someone today.
— Stacia Tauscher

NUMEROUS NATIONAL STUDIES HAVE FOUND THAT MOST OF THE CHILD care in the United States is not high quality. A federally funded National Institute of Child Health and Human Development (NICHD) study released in 1999 concluded that only about 10 percent of children ages three and under are likely to receive "excellent" care. The researchers concluded that most "day care in the United States is 'fair,' but not outstanding."[30] They rated 30 percent of child care as "good," 53 percent as "fair," and 8 percent as "poor."[31] When the authors of *Cost, Quality, and Child Outcomes in Child Care Centers* released their findings in 1995, they found that an estimated six out of seven child care centers provided mediocre to poor care.[32] And one in eight might actually jeopardize children's safety and development.[33] A 1999 report from the U.S. Consumer Products Safety Commission arrives at an even more alarming conclusion: "Two-thirds of licensed child-care centers studied by federal investigators last year had at least one condition that could be hazardous to the safety of children."[34] The quality of home-based child care has also been questioned. According to a 1994 study by the Families and Work Institute, one in three home-based settings provided care that could conceivably hinder a child's development.[35] While survey data show a large percentage of Kentucky parents are satisfied with the availability and affordability of quality child care, expert assessments reveal that what is true nationally is probably also true here: *much of the child care in Kentucky is of questionable quality.*

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[30] National Institute of Health (NIH), "NICHD Child Care Study Investigators to Report on Child Care Quality," (Press Release): (http://www.nih.gov/nichd/docs/news/DAYCAR99.htm), Internet, 26 January 1999.

[31] Christine Russell, "Only 10% of day care is rated excellent," *The Washington Post*, 23 Feb. 1999: Z08.

[32] *The State of America's Children: Yearbook 1998* (Washington, DC: Children's Defense Fund, 1998): 39.

[33] *The State of America's Children*: 39.

[34] Accessed at (http://www.cnn.com/US/9904/12/child.care.hazards.ap/), Internet, 12 April 1999.

[35] Ellen Galinsky, *Study of Children in Family Child Care and Relative Care* (Washington, DC: Families and Work Institute, 1994).

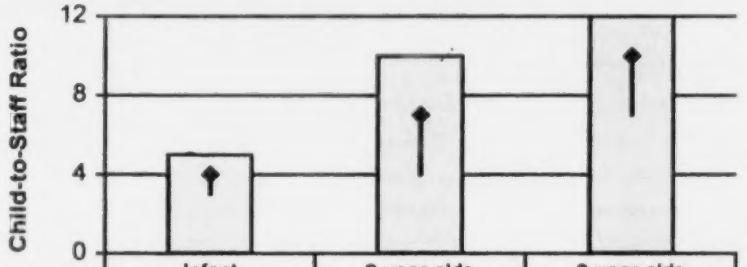
Defining Quality

Quality child care includes several components. Some indicators of quality are easy to measure, while others are much more difficult. Nonetheless, researchers seem to agree on four key elements:[36] child-to-staff ratios; group size; qualifications of caregiver staff; and caregiver stability.

Child-to-staff ratios. Since many studies have concluded that a lower child-to-staff ratio is associated with positive outcomes for the child, like increased verbal development, a small number of children per adult is considered more desirable. However, Kentucky's ratios are consistently higher (i.e., worse according to experts) than the U.S. median and levels recommended by experts.[37] For example, as illustrated in Figure 3, the child-to-staff ratio for 2-year-olds in Kentucky is 10 to 1, compared with the national median of 7 to 1 and the recommended maximum of 6 to 1.

FIGURE 3

Comparison of Kentucky's Child-to-Staff Ratios to the U.S. Median and Ranges Recommended by Experts for Licensed Programs



	Infant	2-year-olds	3-year-olds
KY	5	10	12
Recommended High	4	6	10
Recommended Low	3	4	7
US Median	4	7	10

Note: The bar represents Kentucky's value. The diamond represents the US median. The line in the bar shows the range between the US median and the recommded low by experts.

Group size. Studies show that noise levels and behavior problems increase with the size of the group, thereby limiting the quality time caregivers can spend on the intellectual and social development of children. The National Association for the Education of Young Children (NAEYC), an accrediting organization for licensed programs, recommends at least two teachers per group and the follow-

[36] See the NICHD Child Care Study; *Starting Points*; *Investing in Child Care*; and the *1998 County Data Book* (Kentucky KIDS COUNT Consortium, 1998): 12.

[37] Here infants are defined as nine-month-olds. These data are obtained fromBetty Holcomb, et al., "Child care: How does your state rate?," *Working Mother* (July/August 1998): 30-33.

ing group sizes: infants should be in groups of no more than 6 to 8 children; 2- to 3-year-olds should be in groups of no more than 10 to 14 children; and 4- to 5-year-olds should be in groups of 16 to 20 children.[38] Kentucky allows larger maximum group sizes than recommended by NAEYC: infants are allowed to be in groups as large as 10; 2- to 3-year-olds in groups as large as 20; and 4- to 5-year-olds in groups as big as 28.[39] *Working Mother* magazine convened a panel of nationally recognized experts on child care and early childhood development to assess states' child care regulations and standards. This panel classified states into one of four categories with respect to regulations on group size. States that follow guidelines recommended by NAEYC are rated "Good." Those that set some limits are ranked either "Mediocre" or "Poor." States with no standards are listed as "None." Kentucky falls into the "Mediocre" category (see Table 2).

TABLE 2
An Assessment of Regulations Covering Group Size for Licensed Programs

None	AK, AZ, AR, CA, DE, FL, ID, IA, MI, MT, NE, NV, NM, ND, SC, VA, WV, WY
Poor	GA, LA, MA, NJ, SC, TX, UT
Mediocre	CO, IL, IN, KS, KY, MD, MA, MN, MS, MO, NH, NY, NC, OH, OK, TN, VT, WA, WI
Good	AL, CT, HI, OR, PA, RI

Source: Working Mother, July/August 1998.

Qualifications of caregiver staff. Researchers have found that children whose caregivers have higher levels of training and education tend to demonstrate higher levels of cognitive and language development. A total of 19 states, the District of Columbia (DC), and New York City (NYC)[40] require some pre-service training for teachers in child care centers; Kentucky has no such requirements. Similarly, 32 states, DC, and NYC require directors of child care centers to have some pre-service training. Again, Kentucky has no pre-service training requirements for directors. However, like the majority of states, Kentucky does have requirements for annual ongoing training and education for teachers and directors for both center-based and home-based care (see Table 3).

[38] *General NAEYC Accreditation Information*: (http://www.naeyc.org/accreditation/faw_3.htm), Internet, 3 June 1999.
[39] *Child Care Programs in Kentucky: A Summary of Regulations*, (Community Coordinated Child Care, Louisville, KY, 1996). It should be noted that each of these assumes two staff are present.
[40] New York City has regulations that are separate from New York State.

TABLE 3
Training Requirements for Teachers and Directors in Licensed Programs, 1999

	Number of States Requiring Pre-Service Training		Number of States Requiring Annual Ongoing Hours	
Child Care Center	**US**	**KY**	**US**	**KY**
Teacher	21	NONE	44	SOME*
Director	34	NONE	40	SOME*
Family Child Care				
Small	10	SOME**	32	SOME***
Large	11	NONE	31	SOME*

Source: Sheri L. Azer and Darnae Eldred, Training Requirements in Child Care Licensing Regulations: 1998 (The Center for Career Development in Early Care and Education, Wheelock College), and Child Care Licensing, 1999 Summary Sheet (The Center for Career Development in Early Care and Education, Wheelock College).
Notes: Data in this chart are based on the 50 states, the District of Columbia, and New York City, which has a set of regulations that is separate from New York State, for a total of 52 "states." Also, they define small family child care as one provider legally caring for one or more unrelated children in the provider's residence, and large family child care as two or more providers caring for one or more unrelated children in the residence of one of the providers.
** 12 hours; ** 6 hours of training within the first three months; *** 6 hours*

Caregiver turnover rate. A low level of staff turnover is desirable. Children who experience a revolving door of caregivers are less well-adjusted when they enter school. Because low pay is endemic to the child care industry, turnover rates among child care staff are high. A national study released in 1998 by the Center for the Child Care Workforce found that more than a quarter of child care teachers (27 percent) and 39 percent of assistants had left their jobs during the past year—for an average turnover rate of 31 percent for all staff.[41] They also found that one fifth of centers reported losing half or more of their teaching staff during the past year.[42] Because of relatively low wages[43] (see Table 4) and virtually no increase in real wages among most child care staff over the last decade (see Table 5), high turnover will likely continue to be a problem among caregivers in the United States and Kentucky.

[41] Marcy Whitebook, Carollee Howes, and Deborah Phillips, *Worthy Work, Unlivable Wages: The National Child Care Staffing Study, 1988-1997* (Washington, DC: Center for the Child Care Workforce, 1998): 8. A 31 percent turnover rate was also found among 500 Jefferson County child care programs in a 1998 survey conducted by Community Coordinated Child Care (4-C) in Louisville. See Press Release, Community Coordinated Child Care, 29 Sept. 1998.

[42] Whitebook, et al.

[43] According to Whitebook, et al., teachers (nationally) at the lowest-paid level earn an average of $7.50 per hour or $13,125 per year. Teachers at the highest-paid level earn an average of $10.85 per hour or $18,988 annually. Teaching assistants at the lowest-paid level earn an average of $6.00 per hour or $10,500 per year, and $7.00 per hour or $12,250 per year at the highest-paid level.

TABLE 4
Comparison of Kentucky Child Care Workers' Salaries with Those of Occupations Requiring Similar Educational Preparation Levels*

Occupational Title	Mean Hourly Wage, 1996
Waiters and Waitresses	$5.44
Child Care Workers	***$6.37***
Nursing Aides, Orderlies, and Attendants	$6.93
Receptionists and Information Clerks	$7.52
Stock Clerks - Stockroom, Warehouse or Storage Yard	$8.37
Bus Drivers, School	$8.81
Meter Readers, Utilities	$9.46
Travel Agents	$10.14
Legal Secretaries	$10.84
Truck Drivers, Heavy or Tractor-Trailer	$12.59
Chemical Equipment Controllers and Operators	$17.55

**Using data obtained from the Workforce Development Cabinet, we compiled a list of 139 occupations that require a high school diploma or some postsecondary training. We ranked these occupations from 1st to 139th based upon the mean or average hourly wage and then looked at salary levels at roughly every tenth percentile.*

TABLE 5
Trends in Hourly Wages for Center-Based Child Care Staff
(All figures in 1997 dollars)

Staff Position	1988 Wage	1992 Wage	1997 Wage	Real Change, '92-'97	Real Change, '88-'97
Lowest-Paid Assistant	$5.99	$5.91	$6.00	1.5%	0.2%
Highest-Paid Assistant	$6.96	$7.03	$7.00	-0.4%	0.6%
Lowest-Paid Teacher	$7.38	$7.55	$7.50	-0.7%	1.6%
Highest-Paid Teacher	$9.53	$10.33	$10.85	5.0%	13.9%

Source: Worthy Work, Unlivable Wages: The National Child Care Staffing Study, 1988-1997 (Washington, DC: Center for the Child Care Workforce, 1998). These data are based on a sample of 227 day care centers in Atlanta, Boston, Detroit, Phoenix, and Seattle.

Expert Assessments of Quality

Kentucky allows more children per adult caregiver than most states, has a "mediocre" group size, requires no pre-service training for teachers and directors, and compensates child care workers at low levels. For these reasons, Kentucky's rank in national assessments of child care is not high. In the sections below, we provide details on two national assessments to show where Kentucky fits into the national context.

The Regulatory Status of Center-Based Infant and Toddler Child Care. A 1997 study examined the child care regulations of all states in three broad areas to determine the extent to which they comply with the quality standards speci-

fied in the Federal Interagency Day Care Requirements.[44] Regulations were assessed across three areas: grouping (staff-child ratio and group sizes); staff qualifications and training; and whether the regulations called for developmentally appropriate care. The data were drawn directly from July 1990 state child-care regulations for all 50 states and the District of Columbia. States were classified into one of five categories: optimal, good, minimally acceptable, poor, or very poor/unregulated. No state was classified as "optimal" or "good," 33 percent were considered "minimally acceptable," 59 percent (including Kentucky) were placed in the "poor" category, and 8 percent were judged to be "very poor or unregulated." It should be noted that since 1990, Kentucky's infant-to-staff ratio was lowered from 6 to 1 to 5 to 1, and the maximum group size for infants was lowered from 12 to 10.

Working Mother Magazine's Expert Panel. *Working Mother* magazine convened a national panel of experts[45] in 1998 to rate the quality, safety, and availability of child care in the 50 states and the District of Columbia.[46] The panel considered a range of factors within the three broad categories, such as ratios, training requirements, and whether there is publicly funded pre-kindergarten. The panel could award one to five stars to each state in the categories, but no state obtained a rating of five stars.

Kentucky has "poor" standards according to Young, et al., and has an average score of 2.35 (stars) out of a possible 5.0 from the *Working Mother* expert panel.[47] The two assessments correlate fairly well, with Kentucky in the middle of the pack, more or less, in both rankings (see Table 6).[48] Kentucky is considered to be about typical of most states then, with child care standards that fall far short of what experts believe to be optimal for young children. Even the states with the highest rankings (Connecticut, Hawaii, Maryland, Massachusetts, and Minnesota) do not fully satisfy the requirements experts recommend.

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[44] Kathryn Taaffe Young, Katherine White Marsland, Edward Zigler, "The Regulatory Status of Center-Based Infant and Toddler Child Care," *American Journal of Orthopsychiatry* 67(4), October 1997: 535-544.

[45] The panel of experts included the following individuals: Gina Adams and Helen Blank, Children's Defense Fund; Sheri Azer and Gwen Morgan, The Center for Career Development in Early Care and Education at Wheelock College; Ellen Galinsky, Families and Work Institute; Kay Hollestelle, The Children's Foundation; Evelyn K. Moore, National Black Child Development Institute; Yasmina Vinci, National Association of Child Care Resource and Referral Agencies; Marcy Whitebook, Center for the Child Care Workforce; Barbara Willer, National Association for the Education of Young Children; Faith Wohl, Child Care Action Campaign; and Anne Mitchell, Early Childhood Policy Research.

[46] Betty Holcomb, et al., "Child care: How does your state rate?," *Working Mother* (July/August 1998): 22-38. The evaluation also included the experts' perception of the "commitment" evidenced by the states and the District of Columbia to child care, but we do not use this category because of its relatively high subjectivity.

[47] The average number of stars for all states is 2.54.

[48] The association between the two is statistically significant (Chi-Square=15.3, p=0.018), and fairly strong (Gamma=0.634; Pearson Correlation=0.464). The correlation between them increases when we use the interval level data obtained from Young (Pearson's r=0.61).

TABLE 6
The Quality of Child Care in the States:
A Comparison of Two National Rankings

		Working Mother Magazine Assessment, 1998 (score is equal to the average number of stars for a state based on the quality, safety, and availability ratings)				
		Lowest Quality (score=1 to1.9)	(score = 2 to 2.9)	(score = 3 to 3.9)	(score = 4 to 4.9)	**Highest Quality** (score=5)
Rating by Young, et al.	**Very Poor or Unregulated**	ID, MS	SC, WY			
	Poor	LA, MT, NV, NM, SD	AK, AZ, AR, FL, GA, IN IA, **KY**, NE, NH, NJ, NC, OH, TN, TX, VA, WV	CA, CO, DE, MI, NY, PA, WA		
	Minimally Acceptable	ND	AL, KS, ME, MO, OK, OR, UT	IL, RI, VT, WI	CT, HI, MD, MA, MN	
	Good					
	Optimal					

Public Opinion Data on Child Care in Kentucky

Despite the state's mediocre child care rankings in these national assessments, Kentuckians appear satisfied with the *availability* of high-quality child care in their communities, although a significant percentage have expressed some level of dissatisfaction (approximately 34 to 40 percent). And with respect to the *affordability* of high-quality child care in their communities, they are virtually evenly divided between those who are satisfied and those who are dissatisfied. The trend, however, from 1996 to 1998 shows that an increasing number of Kentuckians are expressing dissatisfaction with both the availability

and affordability of high-quality child care in their communities. Moreover, important differences emerge when we control for other variables like household income, educational attainment, whether they are current day care users, and the relative urbanity (or rurality) of their community.

Method and Data. In the Spring of 1996 and 1998 the Kentucky Long-Term Policy Research Center asked two questions about child care on a statewide survey:[49]

- *Would you describe yourself as extremely satisfied, somewhat satisfied, somewhat dissatisfied, or extremely dissatisfied with the* ***availability*** *of high-quality day care in your community?*[50]
- *Would you describe yourself as extremely satisfied, somewhat satisfied, somewhat dissatisfied, or extremely dissatisfied with the* ***affordability*** *of high-quality day care in your community?*[51]

We used a statistical model to estimate the effect of a series of variables on the probability that an individual will be more or less satisfied with the availability and affordability of quality child care in their community.[52] For example, are individuals in rural Kentucky likely to demonstrate less satisfaction than those in urban areas? Are individuals in households with higher income levels likely to express more satisfaction with the affordability of high-quality care? And what effect does education or day care usage have on their opinions? This kind of analysis allows us to estimate the effect of any one variable, like education level, on the probability of an individual's satisfaction while holding all other variables constant. For example, the model enables us to take two individuals living in a rural area with the same income and child care usage and estimate the effect of education level on satisfaction.

Availability. There appears to be wide variation across Kentucky with respect to the supply of licensed and certified child care spaces and the estimated

[49] The Kentucky survey is conducted by the University of Kentucky Survey Research Center. Households were selected using random-digit dialing, a procedure giving every residential telephone line in Kentucky an equal probability of being called. Calls for the Spring 1996 survey were made from May 6 until June 5, 1996, and from May 11 until June 10, 1998 for the Spring 1998 survey. A total of 629 interviews were completed in 1996 and 658 in 1998. For both surveys, the margin of error is slightly less than 4 percentage points at the 95 percent confidence level. We combined the two surveys into one data set for the analysis because of small sample sizes for some subsets.

[50] There were 189 valid responses to the question in the 1996 survey and 172 valid responses in the 1998 survey. The respondents are adult Kentuckians who indicated that there was at least one child under the age of 18 living in their household. In a vast majority of cases the respondent is the parent or legal guardian of the child, but not always. Nevertheless, the responses are very similar regardless of whether the respondent was the parent.

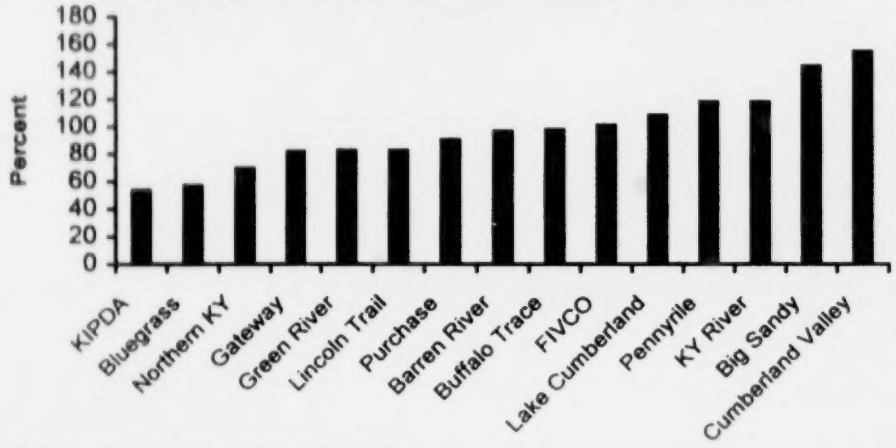
[51] There were 182 valid responses to the question in the 1996 survey and 165 valid responses in the 1998 survey. The respondents are adult Kentuckians who indicated that there was at least one child under the age of 18 living in their household. It should be noted that the respondent is not necessarily the parent or legal guardian of the child. However, the differences in the responses between parents and nonparents are small.

[52] We used a cumulative logit model for ordinal responses. Refer to Appendix B for parameter estimates and predicted probabilities.

demand for those slots.[53] Figure 4 shows that eastern Kentucky has the biggest shortage of licensed and certified slots with respect to estimated demand. There are six Area Development Districts (ADDs) statewide with percentages over 100, and 5 of them are either completely or partially in eastern Kentucky.[54] The Cumberland Valley ADD has an estimated demand-to-supply ratio of 1.56, or 156 percent. This means that for every one child care slot in a licensed center, licensed home, or certified home, there are an estimated 1.56 children who we would expect to seek care in these settings.[55] The more urban ADDs, such as KIPDA, Bluegrass, and Northern Kentucky, stand in stark contrast. The percentages for these ADDs are well below 100, indicating an ample supply of licensed and certified slots relative to estimated demand. One should note, however, that these *averages* can obscure shortages for particular age groups. There are some indications, for example, that the supply of infant care is in chronic short supply in many areas of the state.

FIGURE 4

Estimated Demand for Child Care Slots as a Percentage of Supply by Area Development District



Source: Kentucky Long-Term Policy Research Center.

What is true for Area Development Districts is also true for counties. Rural counties are much more likely to have a shortage of licensed and certified slots with respect to estimated demand. Table 7 shows the distribution of Kentucky counties by urbanity and estimated child care availability. Table 7 shows that 18 percent of rural counties, compared with 68 percent of urban counties, have a

[53] Refer to Appendix A for an explanation of the data and assumptions.

[54] We aggregated all the data to the area development district level before calculating the ratio.

[55] This does not mean that a large percentage of children in these areas are not being cared for. Instead, it seems to suggest that these children are probably being cared for in unregulated homes or centers. Other researchers have discovered that "rural parents are more likely to prefer informal care especially when provided by relatives." Refer to S. Shoffner, "Child Care in Rural Areas: Needs, Attitudes and Preferences, *American Journal of Community Psychology*, 1986, 14(5): 521-39.

demand-to-supply ratio less than or equal to .75, or 75 percent, which would indicate an adequate supply of certified or licensed child care. It also shows that 38 percent of rural counties and only 9 percent of urban counties have a ratio over 1.5, which would indicate a serious shortage of certified or licensed child care. These findings generally conform with what other researchers have found.[56]

TABLE 7
Kentucky Counties by Urbanity and Estimated Child Care Availability

Demand-to-Supply Ratio	Rural	Urban
Less than or equal to .75	18%	68%
Between .76 and 1.5	44%	23%
Over 1.5	38%	9%

Note: Refer to Appendix A for an explanation of how the demand-to-supply ratio is estimated.

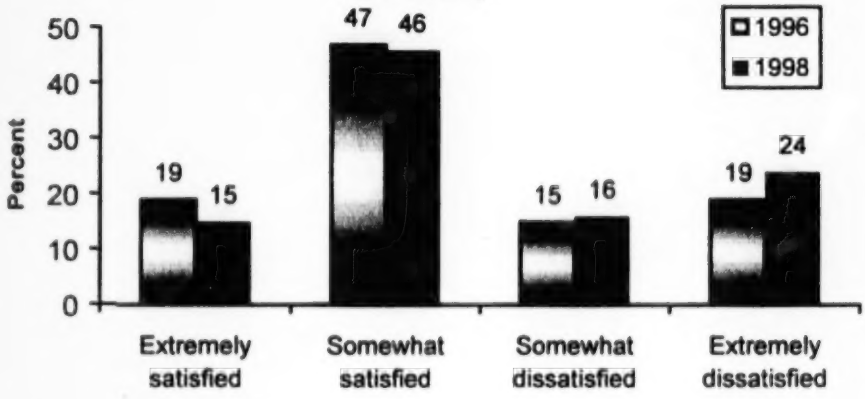
The estimated demand-to-supply ratio for the state is about .75, so it is not surprising that survey results indicate Kentucky adults statewide appear to be satisfied with the availability of high-quality day care in their communities. This raises an important question, which cannot be resolved here, as to whether the average person is able to judge whether a day care is "high quality." Indeed, many would argue that the lay person is not qualified to make such a judgement.[57] Nonetheless, Figure 5 shows that a majority of Kentucky adults are satisfied with the availability of high-quality care in their communities. It needs to be noted, however, that more respondents in the 1998 survey expressed some level of dissatisfaction compared with the 1996 survey.

[56] According to Betty A. Beach, "Rural families experience child care differently from urban ones on a number of counts. Center-based care... is less available to rural children. In many areas, lengthy distances, small and scattered populations and high transportation costs make centers impractical." She goes on to note that "Nearly 75 percent of rural children are not in formal, center-based care; rather, they are found in a variety of informal arrangements such as that provided by friends, relatives, and other siblings." See Betty Beach, "Perspectives on Rural Child Care," ERIC Clearinghouse on Rural Education and Small Schools: (http://aelliot.ael.org/~eric/digests/edorc969.html), Internet, 22 June 1999.

[57] Suzanne W. Helburn and Carollee Howes, "Child Care Cost and Quality," *The Future of Children* (Los Angeles, CA: Center for the Future of Children, The David and Lucile Packard Foundation, 1996) 69.

FIGURE 5

How would you describe your level of satisfaction with the availability of high-quality day care in your community?



Source: Kentucky Long-Term Policy Research Center and UK Survey Research Center.

While a majority of Kentucky adults say they are "satisfied" with the availability of high-quality day care in the community, Table 8 and Figure 6 illustrate the extent to which the education level of the respondent shapes the results. As the education level increases, respondents are *more* likely to be *dissatisfied* (see Figure 6). We show the predicted probabilities for the two extreme education categories in Table 8. A majority (71 percent) of respondents with only a grade school education are estimated to be "satisfied" (.49+.22=.71), while a majority (52 percent) of respondents with a graduate degree are predicted to be *dis*satisfied (.33+.19=.52).

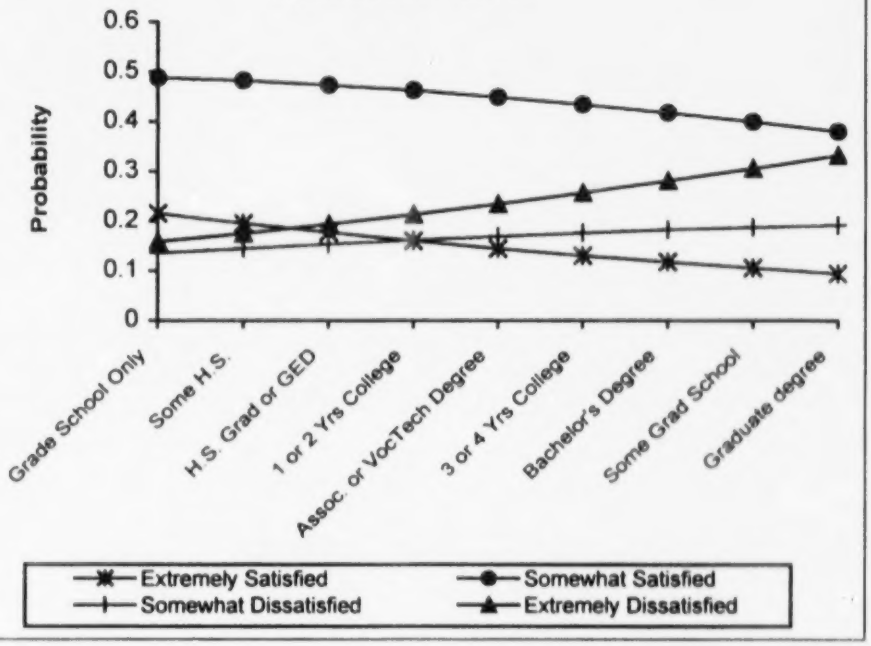
TABLE 8

Estimated Probabilities for Levels of Satisfaction with the Availability of High-Quality Child Care in Kentucky by Education Level

Education Level	Extremely Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Extremely Dissatisfied
Grade School Only	.22	.49	.13	.16
Graduate Degree	.10	.38	.19	.33

Note: Refer to Appendix B for an explanation of how these probability levels are estimated or to view predicted outcomes for education levels between grade school and graduate degree.

FIGURE 6
Estimated Probabilities for Levels of Satisfaction with the Availability of High-Quality Child Care, by Education Level



Affordability. Child care costs are significant. The typical full-time weekly cost for child care in Kentucky is about $80.[58] The cost is usually higher for infants, less for toddlers, and even less for preschoolers. Also, licensed centers cost a little more, typically, than licensed homes and certified homes. And, as we discovered with the regional differences in the demand-to-supply ratio, we also find regional differences in cost. The average weekly cost for child care in urban counties, for example, is higher than in rural counties (Figure 7). Obviously, at $80 per week, this can cost $4,000 annually for just one child.[59] And with a typical Kentucky annual household income between $30,000 and $40,000,[60] child care costs could constitute a significant percentage of total

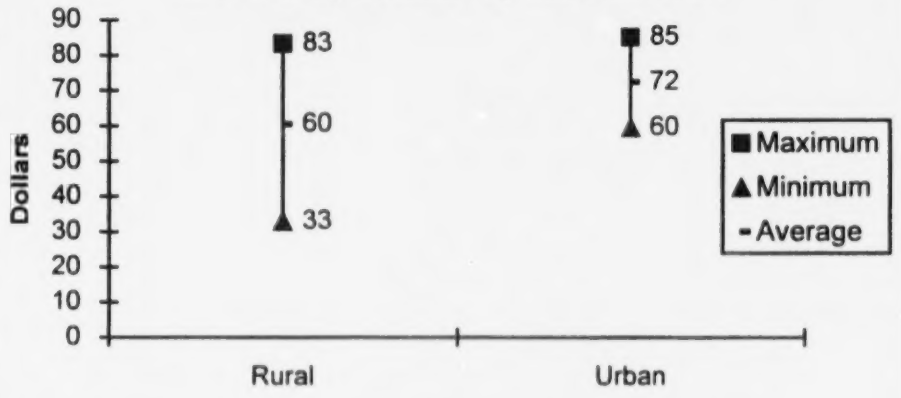
[58] We calculated a weighted average using 1996-97 data of $73.72 for center-based care that includes infants, 1- to 2-year-olds, and 3- to 4-year-olds. These data are publishedin *Kentucky Kids Count 1998 County Data Book* (Louisville, KY: Kentucky Youth Advocates, 1998). Based on U.S. Bureau of Labor Statistics consumer price indexes for "day care and nursery school" from 1995 to 1997, the national rate of price increase was about 4 percent per year. If we assume that the index increased by an average annual rate of 4 percent from 1997 to 1999, then the $73.72 figure increases to $79.74 or about $80 for 1999.

[59] This is based on 50 weeks per year.

[60] This is based on responses in the spring 1996 and 1998 Kentucky surveys conducted by the University of Kentucky Survey Research Center. In 1996, the median income of families with children

household expenditures. Indeed, some have noted that child care can cost more than college tuition.[61]

FIGURE 7
Weekly Costs of Licensed and Certified Child Care in Kentucky Counties by Location, 1997



Source: Kentucky Long-Term Policy Research Center analysis of Kentucky Kids Count Data.
Note: These numbers are the average rates for infants, 1-2 year olds, and 3-4 year olds.

Kentucky adults are split down the middle, more or less, between those who are satisfied and those who are dissatisfied with the affordability of high-quality day care in their community. In the 1996 survey around 53 percent expressed some level of satisfaction, but by 1998 only about 45 percent were satisfied (Figure 8).

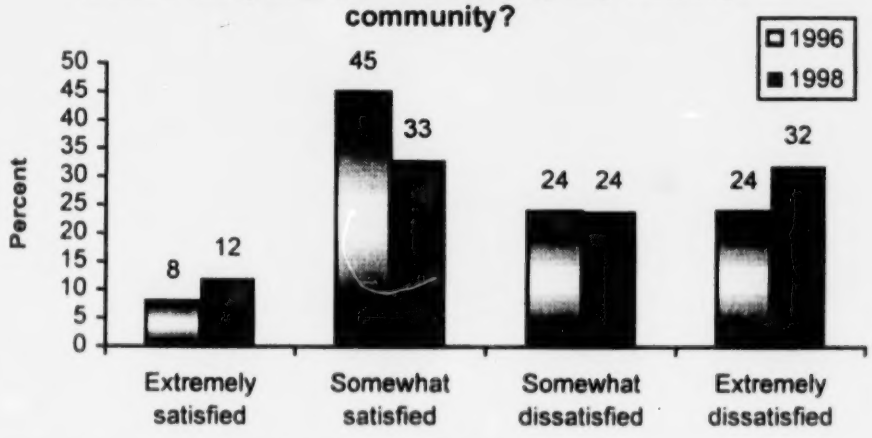
We also find statistically significant relationships between a respondent's opinion about the affordability of high-quality day care in the community and income, education, location, and current day care usage. We find that day care users, individuals with higher incomes, and residents in more rural areas are more likely to be satisfied. However, individuals with higher levels of education are more likely to be dissatisfied. For example, around 46 percent of the respondents with a high school education or less are predicted to be *dis*satisfied with the affordability of high-quality day care in their community. Among those with at least a bachelor's degree, the number rises to 62 percent (Figure 9).

was $33,900 according to *1999 Kids Count Data Book* (Baltimore, MD: The Annie E. Casey Foundation, 1999): 76.

[61] *Kentucky Kids Count: 1998 County Data Book* (Kentucky Youth Advocates, 1998): 20. The authors estimate the average cost of tuition at Kentucky's public universities at $2,418, and the average statewide cost of licensed care for one infant at $3,950 (using 1996-97 child care costs).

FIGURE 8

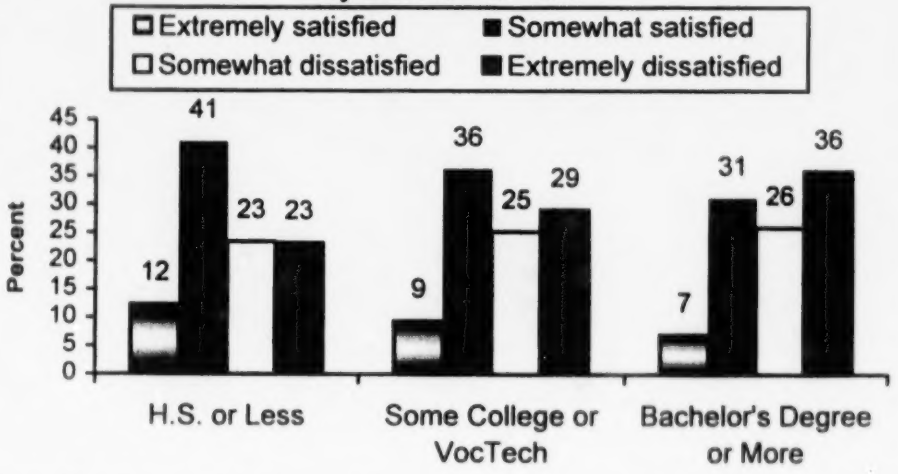
How would you describe your level of satisfaction with the affordability of high-quality day care in your community?



Source: Kentucky Long-Term Policy Research Center and UK Survey Research Center.

FIGURE 9

Estimated Probabilities of Satisfaction with the Affordability of High-Quality Child Care in Kentucky, by Education Level



Source: Kentucky Long-Term Policy Research Center analysis of UK Survey Research Center data.

Conclusion

While the opinion data suggest that many Kentucky parents are satisfied with the availability and affordability of high-quality child care in their communities, expert assessments reveal that what is true nationally is probably also true here: *much of the child care in Kentucky is of questionable quality.* Kentucky allows more children per adult caregiver than most states, has a "mediocre" group size, requires no pre-service training for teachers and directors, and compensates child care workers at low levels. For these reasons, Kentucky's rank in national assessments of child care is not high. Moreover, the statistical analyses of the opinion data show that the more educated Kentuckians are much *less* likely to be satisfied with the availability and affordability of high-quality child care. Since the current status of child care in Kentucky cannot be characterized as "high-quality," we show how to effect future improvements in the next chapter.

HOW CAN WE IMPROVE THE QUALITY OF CHILD CARE IN KENTUCKY?

This will not be an easy task, but if we start now, Kentucky will have the opportunity to be first in the nation in preparing our children for the 21st century.
— Governor Paul Patton

THE INGREDIENTS OF HIGH-QUALITY CHILD CARE ARE WELL KNOWN: A low ratio of children to adult caregiver, a small group size, well-trained caregivers, and a low turnover among caregiver staff. In this chapter, we explore the reasons for Kentucky's below-average child care scores, present five scenarios showing how child care in Kentucky can be improved, and offer cost estimates for each of the scenarios.

Data and Method

We use a statistical model to estimate the relative contribution that various factors have on the quality of child care in Kentucky.[62] This model enables us to identify the factors that account for the difference in quality between Kentucky and the U.S. average. The model also enables us to generate "what if" scenarios by changing ratios, training levels, group sizes, and pay rates to estimate their effects on the quality of child care.

Our measure of quality, or dependent variable, is based on the 1998 *Working Mother* magazine assessment. It is the only publicly available numerical assessment of child care in the 50 states that is current, and it correlates well with the more dated assessment by Young, et al. As explained in the previous chapter, *Working Mother* magazine convened a national panel of experts to rate the quality, safety, and availability of child care in the 50 states, rating them on various factors and awarding ratings between 1 and 5 stars. Five states have an average score of 4 (stars): Connecticut, Hawaii, Maryland, Massachusetts, and Minnesota. The lowest ranking states are Idaho, Louisiana, and Mississippi; these states averaged only 1 star across the categories. The average score for all 50 states is 2.54. Kentucky is just below average, with a score of 2.33.

We use five factors, or independent variables, to explain, predict and estimate a state's child care quality score:

[62] We used a multiple regression model. All variables are statistically significant at the 0.05 level, and the model explains 61 percent of the variance (adjusted r^2=.61). Refer to Appendix C for parameter estimates, correlation matrix, and data.

- **Ratio**—We used the average child-to-staff ratios for infants, 2-year-olds, and 3-year-olds. Kentucky's average of these ratios is 9 (which is the average of 5 for infants, 10 for 2-year-olds, and 12 for 3-year-olds). The U.S. average ratio is 7.7.[63]
- **Group Size**—States that follow the NAEYC guidelines are rated "Good" and coded 3. Otherwise, states are given a "Mediocre" (2) or "Poor" (1) ranking depending upon the extent to which they meet NAEYC standards. States with no standards are given a score of 0. Kentucky's score for this variable is 2, which is considered mediocre.[64]
- **Training**—This variable relates to whether there are pre-service training requirements for *teachers* in *center-based* care. The variable is coded 0 if there are none or 1 if there are some. Kentucky, along with 29 other states, has no pre-service training requirements for teachers.[65]
- **Caregiver Wages**—Studies have found that turnover rates are related to wage rates. We used the 1997 wage estimates for child care workers.[66] The average annual wage for a Kentucky child care worker in 1997 was $13,250, compared with the U.S. average of $14,303.
- **Public pre-K**—About three quarters of the states, including Kentucky, have publicly funded pre-kindergarten. These are usually half-day programs for eligible children. Given the importance of these programs for the social and intellectual development of children, we decided to include this variable in our model. States are coded 1 if they have publicly funded pre-K and 0 if they do not.[67]

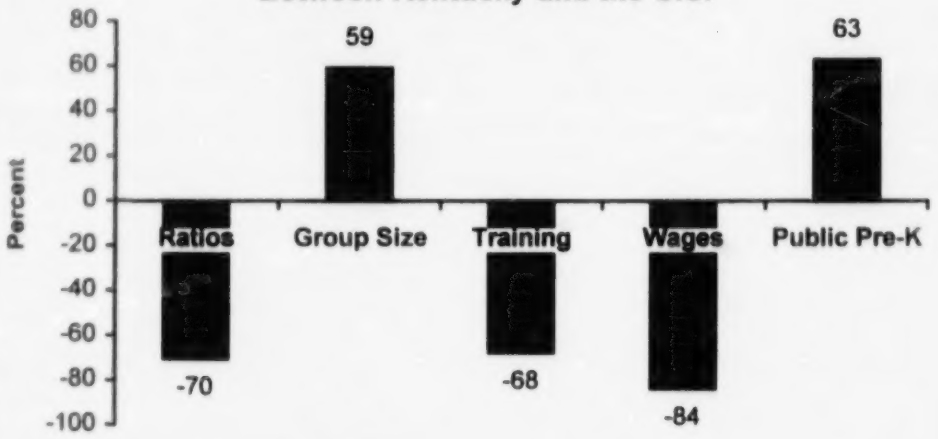
Policy Levers for Enhancing Child Care in Kentucky

Our model allows us to identify the contribution that each factor has on Kentucky's child care score relative to the U.S. average. By doing this, we can identify targets of opportunity, or policy levers, for increasing Kentucky's child care quality score.[68] Figure 10 shows that Kentucky's ratios, training requirements (or lack thereof), and relatively low wage rates are all important factors in bringing down Kentucky's child care score relative to the U.S. average.[69] On the other hand, Kentucky's better than average group size and publicly funded pre-kindergarten help to enhance child care relative to what is typical in the United States. The model results point us toward Kentucky's ratios, training

[63] Ratio data are obtained from Betty Holcomb, et al., "Child care: How does your state rate?," *Working Mother* (July/August 1998): 30.
[64] Holcomb, et al.
[65] The training data are obtained from Sheri L. Azer and Darnae Eldred, *Training Requirements in Child Care Licensing Regulations: 1998* (Boston, MA: Wheelock College, The Center for Career Development in Early Care and Education, 1998).
[66] The U.S. Bureau of Labor Statistics publishes wage data for a number of occupations. Wage data for OES 68038, Child Care Workers, was obtained at: (http://stats.bls.gov/oes/state/oessrch2.htm).
[67] Holcomb, et al.
[68] Refer to Appendix C for an explanation of how this is done.
[69] One should interpret the percentages in Figure 10 as the amount of the difference between Kentucky and the U.S. that is explained by that variable while holding all other variables constant.

requirements, and wage rates as targets of opportunity for enhancing child care in Kentucky.

FIGURE 10
Explaining the Predicted Gap in Child Care Quality Between Kentucky and the U.S.



Source: Kentucky Long-Term Policy Research Center.

Some Scenarios for Enhancing Child Care in Kentucky

The statistical model does a good job in predicting Kentucky's child care score. By using the parameter estimates and Kentucky's actual values for the variables, the model predicts Kentucky's score to be 2.33, exactly the value that *Working Mother* magazine gave it.[70] Kentucky's current situation with respect to child care and five alternative scenarios for improving child care are presented in Table 9.

Scenario One. Kentucky's child care "quality score" increases from 2.3 to 2.6 if the child-to-staff ratio decreases from an average of 9 to an average of 6.6. We choose 6.6 because this is the average for the five states with the highest *overall* child care rating from *Working Mother* magazine.[71] There are numerous ways to lower Kentucky's *average* child-to-staff ratio of 9.[72] For example, Connecticut has child-to-staff ratios of 4 to 1 for infants, 4 to 1 for 2-year-olds, and 10 to 1 for 3-year-olds, which results in an average ratio of 6. Maryland's ratios are 3, 6, and 10 respectively, for an average of 6.3.

Scenario Two. If Kentucky's average ratio is lowered to 6.6 *and* some preservice training is required for teachers in center-based care *and* the average

[70] Refer to Appendix C for an explanation of how to calculate these values.
[71] Connecticut, Hawaii, Maryland, Massachusetts, and Minnesota each have an overall quality score of 4.0.
[72] The average of 9 comes from the child-to-staff ratios of 5:1 for infants, 10:1 for 2-year-olds, and 12:1 for 3-year-olds.

annual caregiver pay is increased to $14,900,[73] the model predicts that Kentucky's child care score would increase to 3.3. There is wide variation among the states with regard to the type and amount of pre-service training and education specified for teachers. For example, Florida requires 30 clock hours of training in early childhood education; Illinois mandates six credit hours in child development; Maryland requires six semester hours in early childhood development; and New Jersey mandates 15 child-related college credits.[74]

Scenario Three. Kentucky's predicted "quality" score increases to 3.4 if ratios decrease, training increases, wages increase, and group sizes fall to reflect NAEYC standards. NAEYC recommends at least two teachers per group and that infants be in groups of no more than 6 to 8 children, 2- to 3-year-olds be in groups of no more than 10 to 14, and 4- to 5-year-olds be in groups of 16 to 20. Kentucky allows larger maximum group sizes: infants are allowed to be in groups as large as 10, 2- to 3-year olds can be in groups as large as 20, and 4- to 5-year-olds can be found in groups as large as 28.

Scenario Four. Scenario four illustrates how Kentucky's child care score can be increased to 3.6 by lowering ratios, increasing training, lowering group sizes, *and* increasing the average annual wage for caregiver staff by 20 percent to $15,900. According to a recent study, some teachers and assistant teachers in NAEYC accredited centers earn between 15 and 20 percent more than their counterparts in nonaccredited centers.[75]

Scenario Five. In this last scenario, the child-to-staff ratio is lowered even more to 5.3. Two states have an average ratio of 5.3: New York and North Dakota. For both states, the child-to-adult ratios are 4 to 1 for infants, 5 to 1 for 2-year-olds, and 7 to 1 for 3-year-olds. In addition to increasing training and lowering group sizes, we increased wages to $17,225, a 30 percent increase over the current average annual wage. This figure approaches the average annual wage for Kentucky's preschool teachers of $17,890.[76] The result of making these changes is that Kentucky's child care score increases to 4.0, which would place it among the child care elite, according to *Working Mother*.

These results identify the policy levers for enhancing child care in Kentucky and suggest how much each lever must move to achieve various outcomes. If policymakers want big improvements in the quality of child care in Kentucky,

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[73] $14,900 is the average annual income for caregivers in states that have some type of pre-service training requirement. This represents about a 12.5 percent increase over Kentucky's current average wage of $13,250.

[74] Azer and Eldred.

[75] Whitebook, et al., 13.

[76] According to the Bureau of Labor Statistics, preschool teachers (OES 31303) "Instruct children (normally up to 5 years of age) in activities designed to promote social, physical, and intellectual growth needed for primary school in preschool, day care center, or other child development facility. May be required to hold State certification," (http://stats.bls.gov/oes/state/oes_ky.htm), Internet, 23 June 1999.

then these results suggest that the child-to-staff ratios need to be lowered, maximum group sizes need to decrease, pre-service training requirements for center-based teachers need to be instituted, and caregiver wages need to be increased.

The problem, of course, is the cost associated with moving policy levers. Lowering the ratio will require more adults for the same number of children, which means that child care costs would likely increase. Likewise, were the required level of pre-service education and training for caregivers increased, child care centers would likely have to pay higher wages. In turn, they would likely raise their fees, and child care costs would increase. In the section below, we explore some of the cost implications of enhancing child care.

TABLE 9
Alternative Scenarios for Enhancing Child Care in Kentucky

Variables	Kentucky Currently	Scenario One	Scenario Two	Scenario Three	Scenario Four	Scenario Five
Ratio	9	6.6	6.6	6.6	6.6	5.3
Training	(0) None	(0) None	(1) Some	(1) Some	(1) Some	(1) Some
Group Size	(2) Mediocre	(2) Mediocre	(2) Mediocre	(3) Good	(3) Good	(3) Good
Wages	$13,250	$13,250	$14,900	$14,900	$15,900	$17,225
Public Pre-K	(1) Yes	(1) Yes	(1) Yes	(1) Yes	(1) Yes	(1) Yes
Child Care Quality Score	2.3	2.6	3.3	3.4	3.6	4.0

Note: See Appendix C for an explanation on how the scores were generated.

Cost Estimates for Enhancing Child Care in Kentucky

We offer the following cost estimates to suggest the financial magnitude of enhancing the quality of child care in Kentucky. Our focus here is on two of the main policy levers: the child-to-staff ratio and caregiver wages. We assume that by increasing wages the child care industry will be able to attract more qualified personnel. As a result, we do not estimate separately the cost of increased pre-service training for teachers. Similarly, we assume that *some* of the cost of decreasing group size will be accounted for in lowering the child-to-staff ratio. We recognize, however, that decreasing group size could have other significant cost implications, like building or construction costs, but we do not attempt to estimate these costs because of data limitations. Moreover, the wage increases we have modelled might not be sufficiently high to attract individuals with the desired education and training. Consequently, we believe our cost estimates are on the low end.

Table 10 shows the assumptions for building the cost projections. There are approximately 7,500 child care workers in Kentucky who make an average an-

nual wage of $13,250.[77] The number of child care workers will have to increase if the average child-to-staff ratio is lowered. For example, if the ratio is lowered from 9 to 6.6, we assume that the number of child care workers will increase from 7,585 to 10,343.[78] If the average annual wage is increased from $13,250 to $15,900 as well, then the total wages for child care workers will increase to $164.5 million ($15,900 times 10,343 workers). This will result in an *additional* $64 million that someone will have to pay.

TABLE 10
Assumptions Used for Estimating Costs

	Example 1	Example 2
If the ratio is lowered from 9 to ...	6.6	5.3
Then the number of child care workers will need to increase from 7,585 to ...	10,343	12,808
And if average annual wages are increased from $13,250 to ...	$15,900	$17,225
Then total wages for child care workers will increase from $101.5 million to ...	$164.5 million	$220.6 million
Which requires this amount in additional dollars	$63,955,341	$120,111,250

We illustrate in Table 11 the estimated total dollar amount necessary as the ratios and wages are changed to various levels. We also show these additional dollars in annual and weekly *per child* amounts.[79] For example, if the ratio remains at 9 and the wages remain at $13,250, then no additional money is needed. Hence, $0 is at the intersection of these two factors. On the other hand, if the ratio is lowered to 5.33 and wages are increased to $17,225, we estimate that, for example, an additional $21 will be needed per child per week.

We should emphasize again that these are probably low estimates. For example, as previously mentioned, we do not take into account construction costs that could potentially result from lowering the maximum group size. Also, we do not take into account the additional Social Security and Medicaid costs asso-

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[77] The U.S. Bureau of Labor Statistics reports on its web site that there were 7,270 child care workers (OES 68038) in Kentucky in 1997 (http://stats.bls.gov/oes/state/oes_ky.htm). Kentucky's Department for Employment Services reports that in 1996 there were 7,900 child care workers (http://www.des.state.ky.us/agencies/wforce/des/lmi/occinf/wages/w60000.htm). We use the average of these two numbers, 7,585.

[78] There are potentially different cost implications resulting from the different ways in which the average ratio is attained because the average ratio is comprised of three child-to-staff ratios (i.e., infants, 2-year-olds, and 3-year-olds). For example, the following illustrative ratios for the three age groups result in an average of 6.0: 4, 5, and 9; 3, 5, and 10; 4, 4, and 10. While each results in an average ratio of 6, the last one can result in around 7.5 percent more caregivers than the first one.

[79] We assume there are 116,000 children in child care for purposes of our calculations. This is approximately the number of slots at centers (131,666) multiplied by the estimated occupancy (88 percent) which equals 115,866. The 88 percent comes from a national study that found 88 percent of center-based slots were filled. Refer to the *1998 Green Book*: 673. Available online at (http://www.access.gpo.gov/congress/wm001.html).

ciated with hiring more child care workers. Nor do these estimates include the cost of any benefits, like health care insurance, that some child care workers receive.[80] Therefore, these results should be viewed as very conservative or low cost estimates.

TABLE 11
Illustrative Cost Implications of Enhancing Child Care in Kentucky

*ADDITIONAL **TOTAL** MONEY NEEDED FOR CHANGING RATIOS AND/OR WAGES*

Ratio	Average Annual Caregiver Wages: $13,250	$14,900	$15,900	$17,225
9	$0	$12.5 million	$20.1 million	$30.2 million
6.6	$36.6 million	$53.6 million	$64 million	$77.7 million
5.33	$69.2 million	$90.3 million	$103.1 million	$120.1 million

*ADDITIONAL MONEY NEEDED **ANNUALLY PER CHILD****

Ratio	Average Annual Caregiver Wages: $13,250	$14,900	$15,900	$17,225
9	$0	$108	$173	$260
6.6	$315	$462	$551	$669
5.33	$597	$779	$889	$1,035

*ADDITIONAL MONEY NEEDED **WEEKLY PER CHILD****

Ratio	Average Annual Caregiver Wages: $13,250	$14,900	$15,900	$17,225
9	$0	$2	$3	$5
6.6	$6	$9	$11	$13
5.33	$12	$16	$18	$21

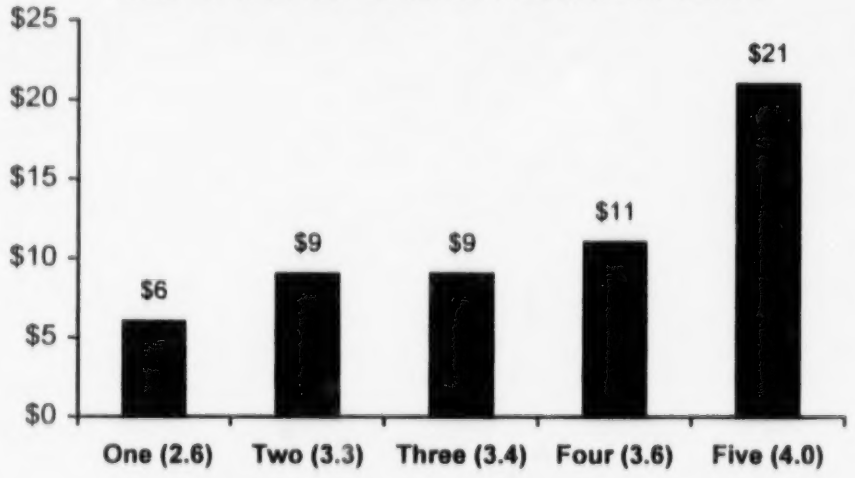
**Assumes 50 weeks and 116,000 children for calculations.*
Hints for reading this table: If the ratio is lowered from 9 to 5.33 and average annual caregiver wages are increased from $13,250 to $17,225, then an additional $120.1 million will be required. This amounts to an additional $1,035 per child per year or $21 per child per week.

[80] A 1988 survey found that about one third of child care teachers received health benefits. See Whitebook, et al.: 19.

We can take the numbers presented in Table 11 and apply them to the scenarios shown in Table 9 to estimate the cost implications of the five scenarios. Figure 11 illustrates the additional money needed weekly per child to implement each scenario.[81] Considering both the quality scores and costs, it appears as if scenarios 2, 3, and 4 are the most attractive. These scenarios are clearly not as expensive as scenario 5, and the model predicts quality scores that would result in a significant increase for Kentucky. Indeed, Kentucky's current quality score would increase from 2.3 to about 3.3, depending upon the scenario. This would have the effect of moving Kentucky's child care quality score from about the 50th percentile to almost the 90th percentile. Obviously, this could result in a huge improvement.

FIGURE 11

Estimated Additional Money Needed Weekly per Child for the Five Scenarios Presented in Table 9



As we mentioned earlier, the cost estimates for each of the five scenarios are on the low end of what it will cost on a per child basis to create a truly high-quality child care system. One published source indicates that the full cost of high-quality child care is $8,500 to $9,000 per child per year.[82] The cost of living in Kentucky is about 91 percent of the national average, which suggests that the cost for Kentucky is between $7,735 and $8,190.

[81] These cost estimates represent average amounts for children in center-based care. So, it would likely be more for infants and less for older preschoolers.

[82] Deanna S. Gomby, Mary B. Larner, Donna L. Terman, Nora Krantzler, Carol S. Stevenson, and Richard E. Behrman, "Financing Child Care: Analysis and Recommendations," *The Future of Children: Financing Child Care* (Los Angeles, CA: Center for the Future of Children, The David and Lucile Packard Foundation, 1996): 25 (fn. 72).

What are we spending now on Kentucky children? Because of various types of subsidies,[83] parents pay between 60[84] percent and 75[85] percent of the actual cost of child care.[86] Currently, the annual per child amount that Kentucky parents are paying for center-based care is estimated at about $4,000.[87] Assuming this represents 67.5[88] percent of actual expenditures, we can assume that an estimated $5,926 is expended per child annually in center-based care. In scenario five, an estimated additional $21 per week per child would have to be spent to achieve a quality score of 4. Assuming a 50-week expenditure, this increases spending by $1,050 to a total of $6,976, which is short of what *some* experts believe to be necessary to create a high-quality system of child care ($7,735 to $8,190 estimated for Kentucky).[89] In fact, some might argue that even the figure of $8,190 is too low.[90] This exercise confirms that even a $21 per week per child increase is probably on the low end of what is necessary to create a high-quality child care system in Kentucky.

Conclusion

Experts generally agree on how to create high quality child care; a low ratio of children to adult caregiver, a small group size, well-trained caregivers, and a low turnover among caregiver staff are all essential. The model results point us toward Kentucky's ratios, training requirements, and wage rates as targets of opportunity for enhancing child care. Specifically, if we want significant improvement in the quality of child care in Kentucky, then our results suggest that the child-to-staff ratios need to be lowered, maximum group sizes need to

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[83] Suzanne W. Helburn and Carollee Howes, "Child Care Cost and Quality," *The Future of Children: Financing Child Care*: 71.

[84] *1998 Kids Count County Data Book*: 19.

[85] Louise Stoney and Mark H. Greenberg, "The Financing of Child Care: Current and Emerging Trends," *The Future of Children: Financing Child Care*: 85.

[86] This is an average figure. Some low income parents will pay a lower percentage and some high income parents will pay a much higher percentage. Not all families, centers, or homes receive subsidies.

[87] This is based on a weighted average of weekly costs multiplied by 50 weeks to get the annual rate. The weekly amounts are obtained from the *1998 Kids Count County Data Book*. It reports that statewide costs for center-based care is $79 per week for infants, $76 for 1- to 2-year-olds, and $70 for 3- and 4-year-olds. We assume that 18 percent of the child care slots are for infants, 35 percent for 1- and 2-year-olds, and 47 percent for 3- and 4-year-olds. Refer to footnote 58 in this report. Our estimated weighted average equals $79.74. When multiplied by 50 weeks, this results in $3,987 annually.

[88] We take the average between 60 and 75 percent.

[89] Using our regression model, we increased caregiver salaries to $20,083, which is the mean annual salary for 138 jobs in Kentucky requiring a similar level of education and training. When we do this, the annual expenditure per child increases to $7,493.

[90] We took two of the estimates listed in Gomby, et al., *The Future of Children*: 25 (fn. 72) and inflated them to 1999 dollars. The two estimates are attributed to Willer ($8,425 in 1990) and Head Start (a doubling of $4,343 in 1994). Using consumer price index factors, we estimate these values to equal between $10,549 and $12,358 in 1999 dollars. After accounting for Kentucky's lower cost of living, this results in a cost of high-quality care in Kentucky between $9,600 and $11,246.

decrease, pre-service training requirements for center-based teachers need to be increased, and caregiver wages need to be increased.

The cost to achieve an increase in quality will vary depending upon the approach. Our results indicate that an expenditure increase of about $10 per child per week will probably help programs make marked improvements in quality.[91] However, to create a program of the highest quality, expenditures will probably need to increase to *well over* $20 per week per child. Clearly, some increase in expenditures will be necessary, probably from several sources, to enhance the quality of child care in Kentucky.

Improving the quality of child care in Kentucky will require efforts on a number of fronts by a number of different actors. Federal, state, and local governments obviously have important roles to play. A number of governmental entities across the country have adopted innovative approaches for generating new public revenue for children's services.[92] These include, but are not limited to, the Children's Services Special Taxing Districts in Florida, which raised about $11 million[93] in the 1994-95 fiscal year to improve the quality of child care and reduce the number of children on the waiting list for subsidized child care, and Colorado's Voluntary Income Tax Checkoff for Child Care, which is expected to generate $250,000 to $500,000 annually to support the professional development of caregivers.[94]

Parents have to become better informed about what constitutes high-quality care and to demand it in the marketplace. It is difficult to doubt that parents want the best for their children and will search out the best child care within the constraints they face. However, several research studies have questioned the ability of parents to recognize quality child care when they see it and have found that parents tend to value cost and convenience over the quality of care.[95]

Businesses and industry groups have to recognize that for many companies investments in child care benefits can benefit their bottom line.[96] For example, an evaluation of one program, LifeWorks, which was designed to assist Johnson & Johnson employees find and recognize quality child care, discovered that Johnson & Johnson saved more than $4 in increased productivity for every $1 invested in its LifeWorks program.[97]

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[91] This is based on the results from scenarios 2, 3, and 4.

[92] Anne Mitchell, Louise Stoney, and Harriet Dichter, *Financing Child Care in the United States: An Illustrative Catalog of Current Strategies* (The Ewing Marion Kauffman Foundation and The Pew Charitable Trusts, 1997): 11-47.

[93] According to Stoney, et al., $63 million was raised, of which just over 70 percent went toward children's direct service programs. Of this amount, about one quarter wenttoward child care programs ($63 million X 70 percent X 25 percent = $11 million).

[94] Stoney, et al.: 12-13, 25.

[95] Helburn and Howes: 69.

[96] *Investing in Child Care: Challenges Facing Working Parents and the Private Sector Response* (U.S. Department of the Treasury, Washington, DC, 1998): (http://www.ustreas.gov/press/releases/docs/chdcare.pdf), Internet, 1 Jan. 1999.

[97] *Investing in Child Care*: 12.

An innovative program in North Carolina called TEACH (Teacher Education and Compensation Helps) shows how the quality of child care can be increased through strategic partnerships among government, child care centers, and educational institutions. Government and private funding help defray the cost of tuition and books for child care workers to attend college, many of whom pursue an associate's degree in early childhood education. Upon completion of a year of study, the employee receives a bonus of at least $100 or a raise in salary.[98] Those who stay in the program for two years realize a 21 percent increase in wages while those who remain in the program three years see a 37 percent hike, according to data collected by Day Care Services.[99] And one small study of 19 TEACH participants found that the quality of care provided by participants who had been in the program for one year was better than the quality provided by caregivers with no college.[100] Another program called WAGES (Workers are Gaining Education and Salary) is designed to reward trained teachers with salary supplements. A teacher with a bachelor's degree can get an extra $2,000 per year.[101] These two programs, TEACH and WAGES, have reduced turnover to 10 percent.[102]

These kinds of successes can be realized in Kentucky as strategic partnerships between the private and public sectors are forged and the realization takes hold that the short-term costs for improvements to early childhood development programs are often much less than the long-term gains accrued from them.

[98] Linda Jacobson, "Learning to Care," *Education Week*, 11 Feb. 1999: 32-35.
[99] Jacobson: 33.
[100] Jacobson: 33.
[101] Jacobson: 35.
[102] Telephone conversation with Linda Locke, Director of Public Policy, Community Coordinated Child Care, Louisville, Kentucky.

ESTIMATES FOR THE NUMBER OF KENTUCKY PRESCHOOLERS IN CHILD CARE

We estimate that over 100,000 Kentucky preschoolers are cared for every day by someone other than a parent or relative in an organized child care facility or by a family day care provider. This represents about one third of all Kentucky children under the age of six. Table A.1 provides the data by county.

TABLE A.1
Estimates of the Number of Kentucky Preschoolers in Organized Child Care
by County

Kentucky	**288,598**	**51.0%**	**103,423**	**137,371**	**33,948**	**75%**
Adair	1,096	52.6%	396	249	(147)	159%
Allen	1,194	64.8%	458	157	(301)	292%
Anderson	1,338	63.8%	511	538	27	95%
Ballard	510	58.8%	190	134	(56)	142%

[103] By organized child care we mean a center or family day care. The following definitions of child care arrangements are provided by the U.S. Census Bureau, *Who's Minding Our Preschoolers?* An *organized child care facility* is a day care center, a nursery school, or a preschool. A *family day care provider* is a nonrelative who cares for one or more unrelated children in her/his home.

[104] These 1997 population estimates for infants up to 4-year-old preschoolers are from the *1998 County Data Book*. We assume that 50 percent of 5-year-olds are not in school.

[105] These 1990 U.S. Census data are obtained from the *County Data Book 1992*.

[106] This is estimated using the data presented in Figure 1 and Table 1 (Chapter 1). Using Adair County as an example, the formula is equal to: (((1,096 * 0.526) * (0.294 + 0.154)) + ((1,096 * (1-0.526)) * (0.22 + 0.04507))) = 396, where 0.294 and 0.154 are the U.S. averages for employed mothers using an organized child care facility (29.4%) or a family day care provider (15.4%), and where 0.22 and 0.045 are the estimated percentages for children whose mothers are **not** in the labor force using organized child care or family-based care. We estimated the family day care at 4.5%.

[107] The *1998 County Data Book*.

[108] This number is equal to the total spaces available minus the estimated number of children using center-based or family child care.

[109] The estimated demand as a percentage of supply is equal to the estimated number of children using center-based or family child care divided by the total spaces available.

TABLE A.1

Barren	2,455	47.1%	862	836	(26)	103%
Bath	738	59.9%	276	315	39	88%
Bell	2,242	30.0%	717	534	(183)	134%
Boone	6,141	58.0%	2,279	4,249	1,970	54%
Bourbon	1,419	51.1%	509	958	449	53%
Boyd	3,125	44.3%	1,082	1,420	338	76%
Boyle	1,703	61.5%	643	889	246	72%
Bracken	607	44.5%	210	329	119	64%
Breathitt	1,175	31.2%	378	196	(182)	193%
Breckinridge	1,147	45.3%	399	414	15	96%
Bullitt	4,507	57.7%	1,670	2,716	1,046	62%
Butler	821	49.4%	292	187	(105)	156%
Caldwell	857	54.0%	312	185	(127)	169%
Calloway	1,876	63.5%	715	1,231	516	58%
Campbell	7,182	57.1%	2,654	3,561	907	75%
Carlisle	362	48.9%	128	12	(116)	1068%
Carroll	683	44.5%	236	123	(113)	192%
Carter	1,865	38.6%	626	487	(139)	129%
Casey	1,025	50.3%	366	295	(71)	124%
Christian	6,574	50.5%	2,350	1,714	(636)	137%
Clark	2,292	56.5%	844	1,603	759	53%
Clay	1,746	34.2%	572	323	(249)	177%
Clinton	639	54.9%	233	146	(87)	160%
Crittenden	648	42.5%	222	247	25	90%
Cumberland	465	51.7%	167	88	(79)	190%
Daviess	7,024	61.7%	2,654	3,777	1,123	70%
Edmonson	738	41.1%	251	161	(90)	156%
Elliott	508	23.4%	156	79	(77)	198%
Estill	1,091	33.2%	355	99	(256)	359%
Fayette	17,341	57.0%	6,405	13,857	7,452	46%
Fleming	934	58.3%	347	183	(164)	190%

TABLE A 1

Estimates of the Number of Kentucky Preschoolers in Organized Child Care by County

Floyd	3,369	29.5%	1,075	602	(473)	179%
Franklin	3,196	62.6%	1,213	2,420	1,207	50%
Fulton	507	49.9%	180	152	(28)	119%
Gallatin	533	52.6%	193	114	(79)	169%
Garrard	918	52.6%	331	443	112	75%
Grant	1,550	55.0%	567	636	69	89%
Graves	2,358	48.0%	832	530	(302)	157%
Grayson	1,600	45.0%	556	806	250	69%
Green	647	61.3%	244	202	(42)	121%
Greenup	2,244	43.3%	773	866	93	89%
Hancock	634	44.5%	220	152	(68)	145%
Hardin	7,753	50.5%	2,771	4,261	1,490	65%
Harlan	2,735	21.8%	834	397	(437)	210%
Harrison	1,210	55.6%	444	393	(51)	113%
Hart	1,155	45.6%	403	152	(251)	265%
Henderson	3,100	58.3%	1,152	1,686	534	68%
Henry	1,066	51.6%	383	421	38	91%
Hickman	344	44.5%	119	65	(54)	183%
Hopkins	3,372	48.7%	1,194	1,600	406	75%
Jackson	986	33.2%	321	188	(133)	171%
Jefferson	51,844	58.0%	19,243	35,363	16,120	54%
Jessamine	2,823	53.8%	1,026	1,009	(17)	102%
Johnson	1,684	38.7%	565	316	(249)	179%
Kenton	12,285	56.3%	4,521	6,711	2,190	67%
Knott	1,357	25.5%	423	537	114	79%
Knox	2,507	38.9%	843	989	146	85%
Larue	844	57.7%	313	375	62	83%
Laurel	3,630	45.8%	1,266	436	(830)	290%
Lawrence	1,082	27.6%	341	56	(285)	609%
Lee	539	21.0%	163	198	35	83%
Leslie	1,113	19.0%	334	245	(89)	136%

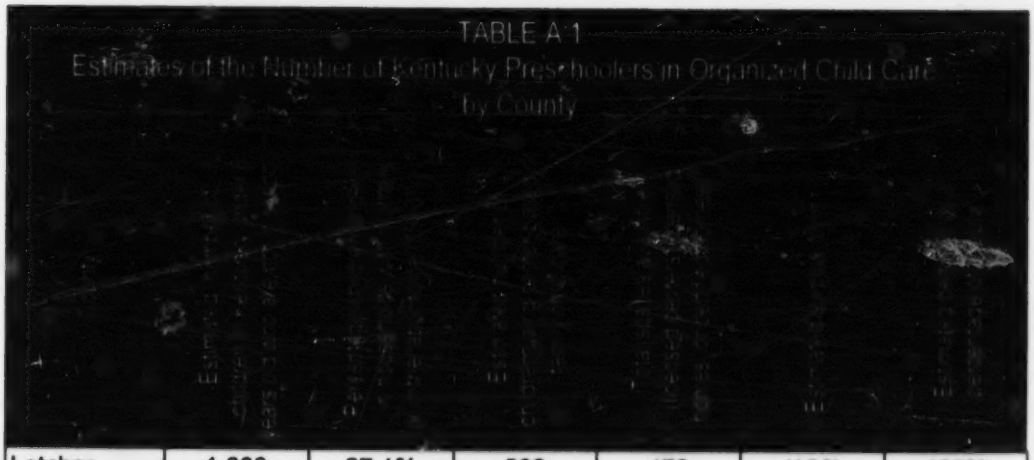

TABLE A-1
Estimates of the Number of Kentucky Preschoolers in Organized Child Care by County

Letcher	1,880	27.1%	592	472	(120)	125%
Lewis	991	47.8%	349	253	(96)	138%
Lincoln	1,633	42.8%	561	104	(457)	539%
Livingston	596	44.9%	207	12	(195)	1723%
Logan	1,821	63.9%	695	276	(419)	252%
Lyon	379	56.9%	140	141	1	99%
Madison	4,424	53.8%	1,608	2,269	661	71%
Magoffin	1,090	25.3%	339	126	(213)	269%
Marion	1,192	58.2%	443	510	67	87%
Marshall	1,853	47.4%	652	550	(102)	119%
Martin	1,059	23.8%	327	64	(263)	510%
Mason	1,241	48.8%	440	586	146	75%
McCracken	4,343	51.1%	1,557	2,091	534	74%
McCreary	1,368	30.4%	439	185	(254)	237%
McLean	649	56.2%	239	43	(196)	555%
Meade	2,822	40.7%	958	348	(610)	275%
Menifee	382	30.2%	122	60	(62)	204%
Mercer	1,400	53.3%	508	719	211	71%
Metcalfe	636	60.4%	239	26	(213)	919%
Monroe	801	71.4%	317	292	(25)	108%
Montgomery	1,456	52.4%	525	837	312	63%
Morgan	920	34.9%	302	200	(102)	151%
Muhlenberg	2,020	45.0%	702	365	(337)	192%
Nelson	2,831	58.7%	1,054	1,103	49	96%
Nicholas	462	47.7%	163	410	247	40%
Ohio	1,557	50.1%	555	420	(135)	132%
Oldham	2,938	53.7%	1,067	3,106	2,039	34%
Owen	678	56.8%	250	109	(141)	230%
Owsley	1,315	33.3%	429	125	(304)	343%
Pendleton	1,133	42.6%	389	162	(227)	240%
Perry	2,453	26.8%	770	818	48	94%

TABLE A.1

Estimates of the Number of Kentucky Preschoolers in Organized Child Care by County

Pike	2,548	29.1%	811	1,034	223	78%
Powell	1,000	40.6%	339	359	20	95%
Pulaski	3,659	49.4%	1,301	1,481	180	88%
Robertson	155	45.6%	54	61	7	88%
Rockcastle	1,173	41.0%	399	65	(334)	614%
Rowan	1,491	42.9%	512	682	170	75%
Russell	1,133	64.1%	433	255	(178)	170%
Scott	2,116	54.3%	771	1,458	687	53%
Shelby	2,096	67.7%	815	1,267	452	64%
Simpson	1,214	56.4%	447	317	(130)	141%
Spencer	635	61.1%	239	298	59	80%
Taylor	1,587	66.7%	614	884	270	69%
Todd	830	53.4%	301	163	(138)	185%
Trigg	724	59.6%	271	123	(148)	220%
Trimble	508	48.6%	180	84	(96)	214%
Union	983	46.3%	344	290	(54)	118%
Warren	5,913	52.2%	2,132	3,815	1,683	56%
Washington	764	64.8%	293	270	(23)	109%
Wayne	1,355	50.4%	484	477	(7)	101%
Webster	922	41.4%	314	160	(154)	196%
Whitley	2,753	42.0%	941	841	(100)	112%
Wolfe	549	32.9%	178	145	(33)	123%
Woodford	1,661	62.1%	629	1,447	818	43%

PARAMETER ESTIMATES AND PREDICTED PROBABILITIES

We used a cumulative logit model for ordinal responses to estimate the relationships between answers to the survey questions on the availability and affordability of high-quality day care in the community and the explanatory variables of education, income, urbanity (or rurality) of their county,[110] and day care usage.

In the Spring of 1996 and 1998 the Kentucky Long-Term Policy Research Center asked two questions about child care on the University of Kentucky Survey Research Center Kentucky survey:[111]

- *Would you describe yourself as extremely satisfied, somewhat satisfied, somewhat dissatisfied, or extremely dissatisfied with the **availability** of high-quality day care in your community?*
- *Would you describe yourself as extremely satisfied, somewhat satisfied, somewhat dissatisfied, or extremely dissatisfied with the **affordability** of high-quality day care in your community?*

For both dependent variables, extremely satisfied equals one, somewhat satisfied equals two, somewhat dissatisfied equals three, and extremely dissatisfied equals four. The mean for availability equals 2.42, while the mean for affordability equals 2.68.

We use the parameter estimates in Tables B.1 and B.3 to calculate estimated probabilities.[112] The generic formula for calculating cumulative probabilities is:

$$P(Y \leq j) = ((\exp(\alpha_j + \beta x)) / (1 + (\exp(\alpha_j + \beta x))))$$

We offer the following specific example to illustrate how to calculate the probability that a current day care user (DAY CARE USAGE = 1) is extremely satisfied with the availability of high-quality care; we use the mean values for the education, income, and Beale variables and "1" for day care usage. The formula below is equal to 0.2603, which means there is a .26 probability that, *ceteris paribus*, a day care user would express "extremely satisfied" when asked about the availability of quality day care in their community:

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[110] We use the USDA Beale Codes to measure urbanity/rurality.

[111] Refer to chapter 2, "Opinion Data on Child Care in Kentucky," for additional information about the survey.

[112] See Alan Agresti, *An Introduction to Categorical Data Analysis* (New York, N.Y.: John Wiley & Sons, Inc., 1996): 214.

$$\frac{\exp(-1.361 + (-0.121 \times 4.255) + (0.024 \times 8.164) + (-0.022 \times 4.61) + (0.742 \times 1))}{(1 + \exp(-1.361 + (-0.121 \times 4.255) + (0.024 \times 8.164) + (-0.022 \times 4.61) + (0.742 \times 1)))}$$

Table B.1
Model Estimates on the Availability of Quality Care

Variable	Parameter Estimate	Standard Error	Pr> Chi Square	Mean
INTERCP1	-1.361	.412	0.009	.
INTERCP2	0.798	.404	0.048	.
INTERCP3	1.592	.412	0.001	.
EDUCATION	-0.121	.060	0.045	4.25527
INCOME	0.024	.037	0.520	8.16375
BEALE CODE	-0.022	.038	0.562	4.60561
DAY CARE USAGE	0.742	.272	0.007	0.13989

The generated values with this formula are cumulative probabilities, so we have subtracted the values between the categories to obtain the probabilities for each of the response values. These estimated probabilities are presented in Table B.2.

Table B.2
Estimated Probabilities of Satisfaction About the Availability of Quality Day Care by Explanatory Variable

	Satisfaction Level				
DAY CARE USAGE	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(0) No	0.14	0.45	0.17	0.24	100%
(1) Yes	0.26	0.49	0.12	0.13	100%
	Satisfaction Level				
ANNUAL HOUSEHOLD INCOME	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(1) Under $5,000	0.14	0.44	0.17	0.25	100%
(2) $5-7.5K	0.14	0.44	0.17	0.25	100%
(3) $7.5-10K	0.14	0.45	0.17	0.24	100%
(4) $10-12.5K	0.14	0.45	0.17	0.24	100%
(5) $12.5-15K	0.15	0.45	0.17	0.23	100%
(6) $15-20K	0.15	0.45	0.17	0.23	100%
(7) $20-25K	0.15	0.46	0.17	0.22	100%
(8) $25-30K	0.16	0.46	0.16	0.22	100%

Table B 2
Estimated Probabilities of Satisfaction About the Availability of Quality Day Care by Explanatory Variable

(9) $30-40K	**0.16**	**0.46**	**0.16**	**0.22**	**100%**
(10) $40-50K	0.16	0.46	0.16	0.21	100%
(11) $50-70K	0.17	0.47	0.16	0.21	100%
(12) $70-90K	0.17	0.47	0.16	0.20	100%
(13) $90-120K	0.17	0.47	0.16	0.20	100%
(14) Over $120,000	0.18	0.47	0.15	0.20	100%
	Satisfaction Level				
EDUCATION	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(1) Grade School Only	0.22	0.49	0.14	0.16	100%
(2) Some H.S.	0.20	0.48	0.15	0.18	100%
(3) H.S. Grad or GED	0.18	0.47	0.15	0.19	100%
(4) 1 or 2 Years College	0.16	0.46	0.16	0.21	100%
(5) Assoc. or Voc-Tech Degree	0.15	0.45	0.17	0.24	100%
(6) 3 or 4 Years College	0.13	0.43	0.18	0.26	100%
(7) Bachelor's Degree	0.12	0.42	0.18	0.28	100%
(8) Some Graduate School	0.11	0.40	0.19	0.31	100%
(9) Graduate Degree	0.09	0.38	0.19	0.33	100%
	Satisfaction Level				
BEALE	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(0) Central counties of metropolitan areas of 1 million population or more	0.17	0.47	0.16	0.20	100%
(1) Fringe counties of metropolitan areas of 1 million population or more	0.17	0.47	0.16	0.21	100%
(2) Counties in metropolitan areas of 250,000 - 1,000,000 population	0.16	0.47	0.16	0.21	100%

Table B.2 Estimated Probabilities of Satisfaction About the Availability of Quality Day Care by Explanatory Variable					
(3) Counties in metropolitan areas of less than 250,000 population	0.16	0.46	0.16	0.21	100%
(4) Urban population of 20,000 or more, adjacent to a metropolitan area	0.16	0.46	0.16	0.22	100%
(5) Urban population of 20,000 or more, not adjacent to a metropolitan area	0.16	0.46	0.16	0.22	100%
(6) Urban population of 2,500-19,999, adjacent to a metropolitan area	0.15	0.46	0.17	0.22	100%
(7) Urban population of 2,500-19,999, not adjacent to a metropolitan area	0.15	0.45	0.17	0.23	100%
(8) Completely rural (no places with a population of 2,500 or more), adjacent to a metropolitan area	0.15	0.45	0.17	0.23	100%
(9) Completely rural (no places with a population of 2,500 or more), not adjacent to a metropolitan area	0.14	0.45	0.17	0.24	100%

Table B.3
Model Estimates on the Affordability of Quality Care

Variable	Parameter Estimate	Standard Error	Pr> Chi Square	Mean
INTERCP1	-2.9679	.4425	0.0001	.
INTERCP2	-0.8665	.4052	0.0325	.
INTERCP3	0.1976	.4027	0.6238	.
EDUCATION	-0.1034	.0609	0.0894	4.25527
INCOME	0.0805	.0369	0.0290	8.16375
BEALE CODE	0.1023	.0392	0.0091	4.60561
DAY CARE USAGE	0.5895	.2684	0.0281	0.13989

Table B.4
Estimated Probabilities of Satisfaction About the Affordability of Quality Day Care by Explanatory Variable

	Satisfaction Level				
DAY CARE USAGE	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(0) No	0.0928	0.3627	0.2525	0.2919	100%
(1) Yes	0.1558	0.4456	0.2125	0.1861	100%
	Satisfaction Level				
ANNUAL HOUSEHOLD INCOME	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(1) Under $5,000	0.0588	0.2792	0.2587	0.4033	100%
(2) $5-7.5K	0.0634	0.2928	0.2597	0.3841	100%
(3) $7.5-10K	0.0683	0.3066	0.2599	0.3652	100%
(4) $10-12.5K	0.0736	0.3203	0.2593	0.3468	100%
(5) $12.5-15K	0.0793	0.3340	0.2579	0.3288	100%
(6) $15-20K	0.0854	0.3475	0.2558	0.3113	100%
(7) $20-25K	0.0919	0.3609	0.2529	0.2943	100%
(8) $25-30K	0.0988	0.3740	0.2494	0.2778	100%
(9) $30-40K	0.1062	0.3867	0.2451	0.2620	100%
(10) $40-50K	0.1141	0.3989	0.2403	0.2467	100%
(11) $50-70K	0.1225	0.4106	0.2348	0.2321	100%

Table B.4
Estimated Probabilities of Satisfaction About the Affordability of Quality Day Care by Explanatory Variable

(12) $70-90K	**0.1314**	**0.4216**	**0.2289**	**0.2180**	**100%**
(13) $90-120K	0.1409	0.4320	0.2225	0.2046	100%
(14) Over $120,000	0.1509	0.4415	0.2157	0.1918	100%
	Satisfaction Level				
EDUCATION	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(1) Grade School Only	0.1346	0.4253	0.2267	0.2133	100%
(2) Some H.S.	0.1230	0.4113	0.2345	0.2312	100%
(3) H.S. Grad or GED	0.1123	0.3962	0.2414	0.2501	100%
(4) 1 or 2 Years College	0.1024	0.3803	0.2474	0.2700	100%
(5) Assoc. or Voc-Tech Degree	0.0933	0.3636	0.2522	0.2908	100%
(6) 3 or 4 Years College	0.0849	0.3465	0.2560	0.3126	100%
(7) Bachelor's Degree	0.0772	0.3290	0.2585	0.3352	100%
(8) Some Graduate School	0.0702	0.3114	0.2598	0.3587	100%
(9) Graduate Degree	0.0637	0.2938	0.2597	0.3828	100%
	Satisfaction Level				
BEALE	(1) Extremely Satisfied	(2) Somewhat Satisfied	(3) Somewhat Dissatisfied	(4) Extremely Dissatisfied	TOTAL
(0) Central counties of metropolitan areas of 1 million population or more	0.0649	0.2971	0.2598	0.3782	100%
(1) Fringe counties of metropolitan areas of 1 million population or more	0.0714	0.3145	0.2596	0.3544	100%
(2) Counties in metropolitan areas of 250,000 - 1,000,000 population	0.0784	0.3320	0.2582	0.3314	100%
(3) Counties in metropolitan areas of less than 250,000 population	0.0862	0.3492	0.2555	0.3091	100%

Table B.4 Estimated Probabilities of Satisfaction About the Affordability of Quality Day Care by Explanatory Variable					
(4) Urban population of 20,000 or more, adjacent to a metropolitan area	0.0946	0.3661	0.2516	0.2877	100%
(5) Urban population of 20,000 or more, not adjacent to a metropolitan area	0.1037	0.3825	0.2466	0.2672	100%
(6) Urban population of 2,500-19,999, adjacent to a metropolitan area	0.1136	0.3981	0.2406	0.2477	100%
(7) Urban population of 2,500-19,999, not adjacent to a metropolitan area	0.1243	0.4129	0.2336	0.2291	100%
(8) Completely rural (no places with a population of 2,500 or more), adjacent to a metropolitan area	0.1359	0.4267	0.2259	0.2115	100%
(9) Completely rural (no places with a population of 2,500 or more), not adjacent to a metropolitan area	0.1484	0.4392	0.2175	0.1950	100%

REGRESSION ESTIMATES AND PREDICTED CHILD CARE QUALITY SCORES

We use a multiple regression model to estimate the relative contribution that various factors have on the quality of child care in Kentucky. This model enables us to identify the factors that account for the difference in quality between Kentucky and the U.S. average. The model also enables us to generate "what if" scenarios by changing ratios, training levels, group sizes, and pay rates to estimate their effect on the quality of child care in Kentucky.

We use the parameter estimates in Table C.1 to calculate predicted child care quality scores. The formula for calculating these scores is:

$$\hat{Y} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

Where,

$\hat{Y}$ = the predicted child care quality score

α = intercept

$\beta_1 X_1$ = RATIOS coefficient X the average child-to-staff ratio for the state (i.e., infants, 2-year-olds, 3-year-olds)

$\beta_2 X_2$ = TRAINING coefficient X whether pre-service training is required for teachers in center based care (0 or 1)

$\beta_3 X_3$ = GROUP SIZE coefficient X the state's group size score

$\beta_4 X_4$ = CARE GIVER WAGES coefficient X the annual wages for child care workers (OES 68038)

$\beta_5 X_5$ = PUBLIC PRE-K coefficient X whether there is publicly funded pre-K in the state (0 or 1)

The model allows us to identify the contribution that each factor has on Kentucky's child care score relative to the U.S. average. Using the coefficients in Table C.1, we generate predicted scores by changing the values of the independent variable one at a time; we use the mean values for the independent variables. The model explains 61 percent of the variation in the dependent variable (adjusted r-squared equals 0.61).

Table C.1 Model Estimates						
Variable	**Parameter Estimate**	**S.E.**	**T**	**Sig.**	**U.S. Mean**	**KY Value**
INTERCEPT	0.3836	1.136	0.338	0.74	.	.
RATIOS	-0.1155	0.0538	-2.146	0.04	7.733	9
TRAINING	0.3907	0.1562	2.501	0.02	.36	0
GROUP SIZE	0.1662	0.0691	2.404	0.02	1.26	2
CARE GIVER WAGES	0.00017	0.0001	2.558	0.01	$14,303	$13,250
PUBLIC PRE-K	0.4656	0.1723	2.702	0.01	.72	1

Table C.2 Correlation Matrix Pearson's r / Significance / Sample size = 50						
Variable	CHILD CARE QUALITY SCORE	RATIOS	TRAIN-ING	GROUP SIZE	CARE GIVER WAGES	PUBLIC PRE-K
CHILD CARE QUALITY SCORE	1.00 0.0	-	-	-	-	-
RATIOS	-0.45435 0.0009	1.00 0.0	-	-	-	-
TRAINING	0.40819 0.0033	0.0213 0.8831	1.00 0.0	-	-	-
GROUP SIZE	0.4630 0.0007	-0.2886 0.0421	0.0901 0.534	1.00 0.0	-	-
CARE GIVER WAGES	0.6759 0.0001	-0.4866 0.0003	0.3242 0.0216	0.3007 0.0338	1.00 0.0	-
PUBLIC PRE-K	0.4906 0.0003	-0.0399 0.7831	0.1893 0.1879	0.1925 0.1804	0.3962 0.0044	1.00 0.0

Table C.3
Data Used for the Multiple Regression Analysis

STATE	CHILD CARE QUALITY SCORE	RATIOS	TRAINING	GROUP SIZE	CARE GIVER WAGES	PUBLIC PRE-K
AK	2.00	7.00	0	0	$ 16,830	1
AL	2.00	8.67	0	3	$ 13,460	0
AR	2.00	10.00	0	0	$ 12,200	1
AZ	2.00	8.67	0	0	$ 13,280	1
CA	3.67	9.33	1	0	$ 16,140	1
CO	3.33	7.33	0	2	$ 14,280	1
CT	4.00	6.00	0	3	$ 18,110	1
DE	3.00	8.67	1	0	$ 14,620	1
FL	2.33	10.00	1	0	$ 14,170	1
GA	2.33	10.33	1	1	$ 13,340	1
HI	4.00	8.00	1	3	$ 14,030	1
IA	2.33	6.00	0	0	$ 13,200	1
ID	1.00	10.00	0	0	$ 13,660	0
IL	3.00	7.33	1	2	$ 16,130	1
IN	2.67	6.33	0	2	$ 13,950	0
KN	2.67	7.33	1	2	$ 13,210	0
KY	2.33	9.00	0	2	$ 13,250	1
LA	1.00	10.67	0	1	$ 12,310	1
MA	4.00	5.67	1	2	$ 17,860	1
MD	4.00	6.33	1	2	$ 15,060	1
ME	2.67	6.33	0	1	$ 16,020	1
MI	3.00	6.00	0	0	$ 15,360	1
MN	4.00	7.00	1	2	$ 16,420	1
MO	2.33	7.33	0	2	$ 13,960	0
MS	1.00	10.33	0	2	$ 11,920	0
MT	1.67	6.67	1	0	$ 12,770	0
NB	2.67	6.67	0	0	$ 13,430	0
NC	2.67	10.00	0	2	$ 13,910	1
ND	1.67	5.33	0	0	$ 12,850	0
NH	2.33	6.00	1	2	$ 14,880	1
NJ	2.67	7.00	1	1	$ 16,800	1
NM	1.67	9.33	0	0	$ 13,500	0
NV	1.67	9.67	1	0	$ 14,680	0

Table C.3
Data Used for the Multiple Regression Analysis

STATE	CHILD CARE QUALITY SCORE	RATIOS	TRAINING	GROUP SIZE	CARE GIVER WAGES	PUBLIC PRE-K
NY	3.00	5.33	0	2	$ 16,340	1
OH	2.67	8.00	0	2	$ 14,260	1
OK	2.33	8.00	0	2	$ 13,270	1
OR	2.33	6.00	0	3	$ 15,210	1
PA	3.00	6.67	0	3	$ 14,790	1
RI	3.00	6.33	1	3	$ 15,140	1
SC	2.00	9.67	0	0	$ 12,970	1
SD	1.67	6.67	0	1	$ 13,750	0
TN	2.00	7.67	0	2	$ 12,530	1
TX	2.33	11.33	1	1	$ 13,350	1
UT	2.33	7.67	0	1	$ 13,590	0
VA	2.00	8.00	0	0	$ 13,950	1
VT	3.33	6.33	1	2	$ 15,500	1
WA	3.67	7.00	0	2	$ 15,190	1
WI	3.33	6.67	1	2	$ 14,660	1
WV	2.33	7.33	0	0	$ 12,470	1
WY	2.00	7.67	0	0	$ 12,580	0

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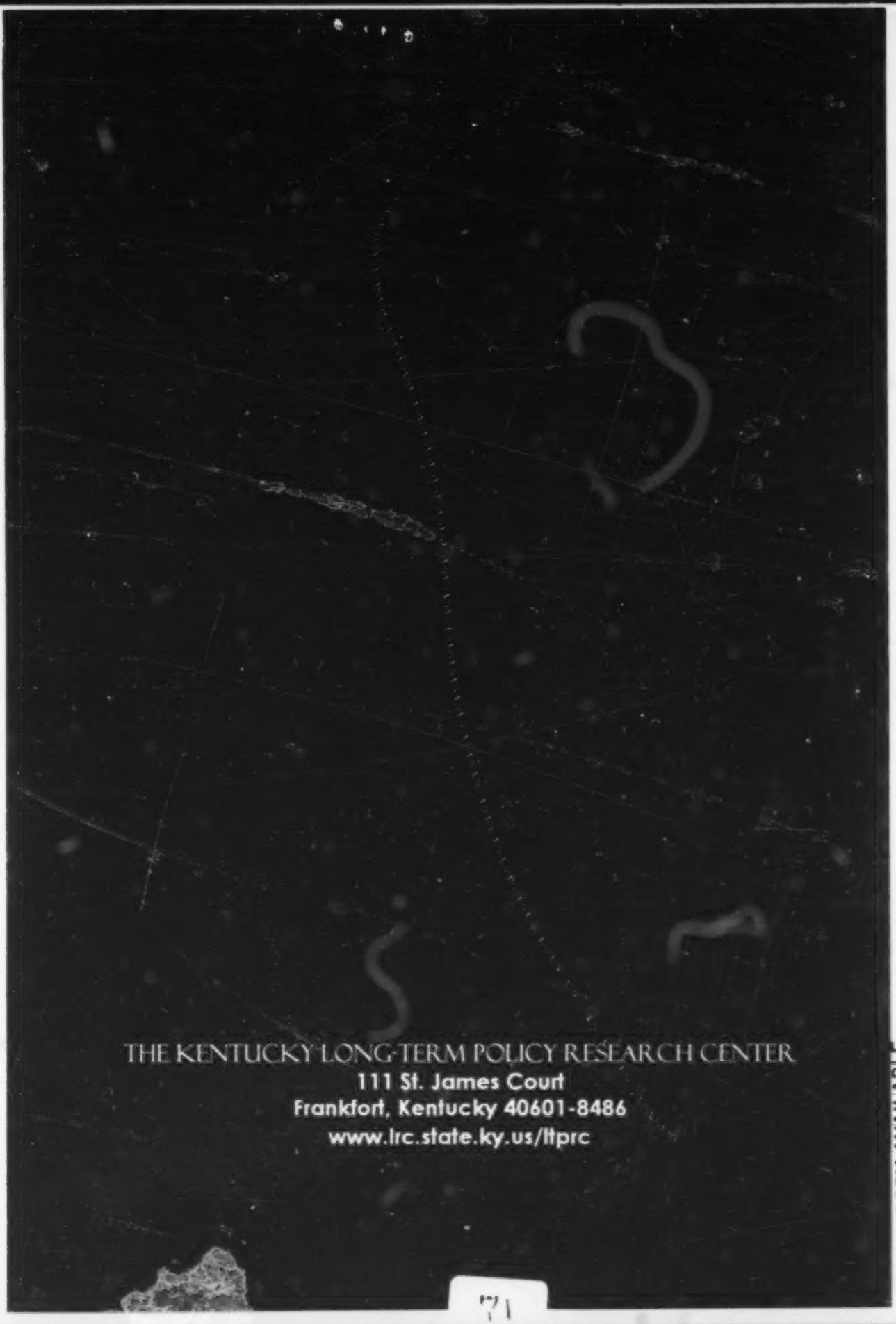

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